

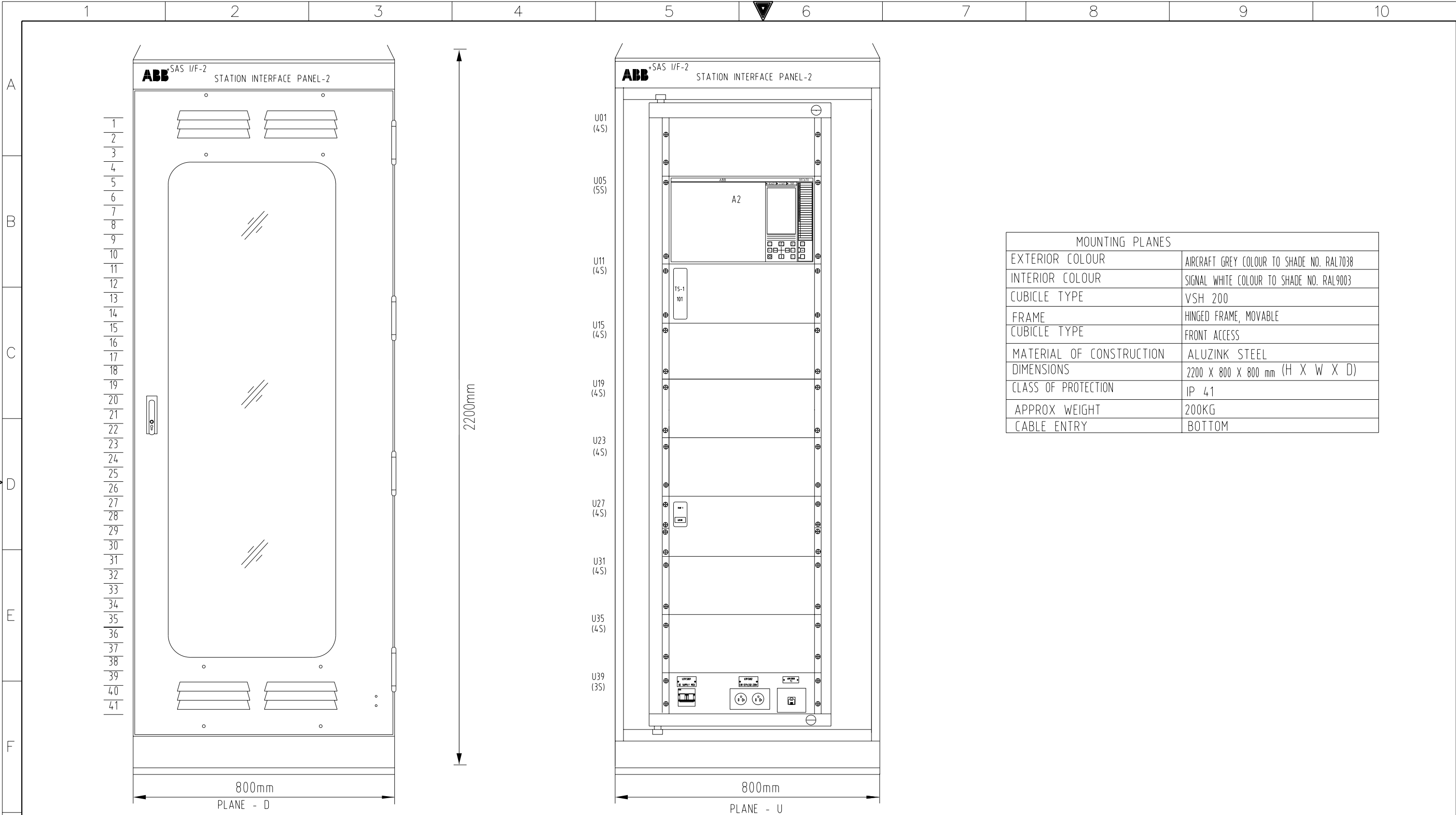


	1	2	3	4	5	6	7	8	9	10
A			POWER SYSTEMS NETWORK MANAGEMENT PROTECTION AND SUBSTATION AUTOMATION SYSTEMS WBS NO: S-13656					ABB AUTOMATION COMPANY LTD., 414, AL-KHARJ ROAD SECOND INDUSTRIAL CITY RIYADH-11383 K.S.A		
B										
C										
D	CONTRACTOR : ABB Contracting Company									
	CLIENT : National Grid sa									
	PROJECT : CONSTRUCTION OF NEW 132/13.8kV SS 8709 IN AL-KHARJ CITY									
	SUBSTATION : S/S 8709									
E	CONTRACT NO. : 11131113/00									
	TITLE : Assembly Drawing - +SAS I/F-2									
F										
G	AS-BUILT BY _____ DATE _____		CONTRACT NO. 11131113/00		JOB ORDER NO. S-13656		COVER SHEET		<div>الشركة الوطنية لنقل الكهرباء</div> <div> نقل الكهرباء National Grid sa</div>	
			DRAWN BY RIZ CHECKED BY JKR		SAS INTERFACE PANEL +SAS I/F-2		S/S 8709 S-13656		INDEX PLANT NO. DRAWING NUMBER SHEET NO. REV. NO.	
	00	13 20	FOR APPROVAL		DATE STARTED 15.3.2013 DATE COMPLETED _____		RIYADH SAUDI ARABIA		P C421 CD-322987 G00G01 00	
	REV. NO.	DATE	DESCRIPTION		OPRG. DEPT. CTPD ENG. DEPT. AUT-PSAC					

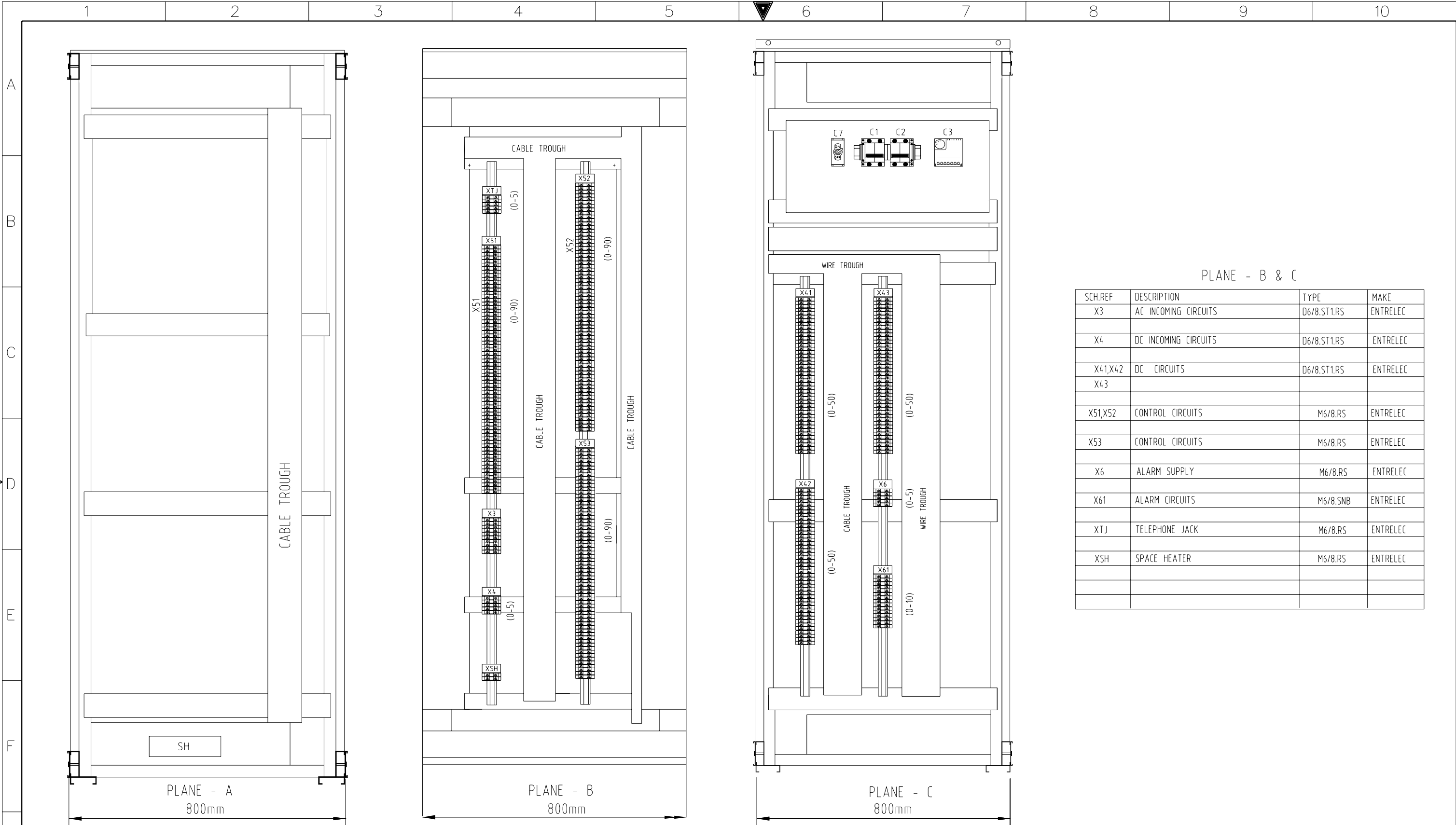


AS-BUILT BY _____ DATE _____ CONTRACT NO. 11131113/00 JOB ORDER NO. S-13656

			DRAWN BY <u>RIZ</u> CHECKED BY <u>JKR</u>
			DATE STARTED <u>15.3.2013</u> DATE COMPLETED _____
00	13 20	FOR APPROVAL	OPRG. DEPT. <u>CTPD</u> ENG. DEPT. <u>AUT-PSAC</u>
REV. NO.	DATE	DESCRIPTION	


ASSEMBLY DRAWING	
SAS INTERFACE PANEL +SAS I/F-2	
S/S 8709	S-13656
RIYADH	SAUDI ARABIA

الشركة الوطنية لنقل الكهرباء National Grid sa				
INDEX	PLANT NO.	DRAWING NUMBER	SHEET NO.	
P	C421	CD-322987	SHT	CONT.
			G01	G02
				00



PLANE - B & C

SCH.REF	DESCRIPTION	TYPE	MAKE
X3	AC INCOMING CIRCUITS	D6/8.ST1.RS	ENTRELEC
X4	DC INCOMING CIRCUITS	D6/8.ST1.RS	ENTRELEC
X41,X42 X43	DC CIRCUITS	D6/8.ST1.RS	ENTRELEC
X51,X52	CONTROL CIRCUITS	M6/8.RS	ENTRELEC
X53	CONTROL CIRCUITS	M6/8.RS	ENTRELEC
X6	ALARM SUPPLY	M6/8.RS	ENTRELEC
X61	ALARM CIRCUITS	M6/8.SNB	ENTRELEC
XTJ	TELEPHONE JACK	M6/8.RS	ENTRELEC
XSH	SPACE HEATER	M6/8.RS	ENTRELEC

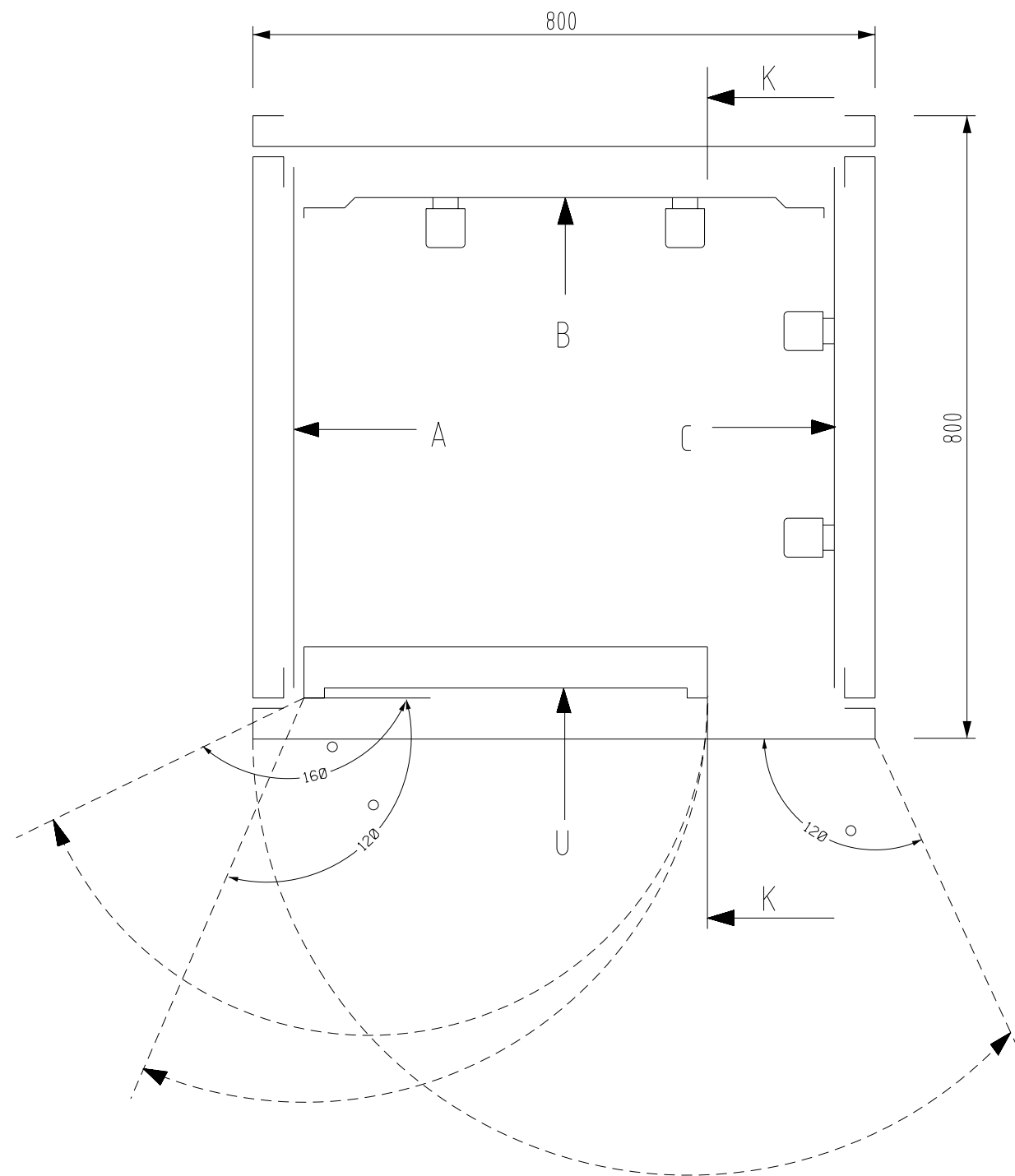
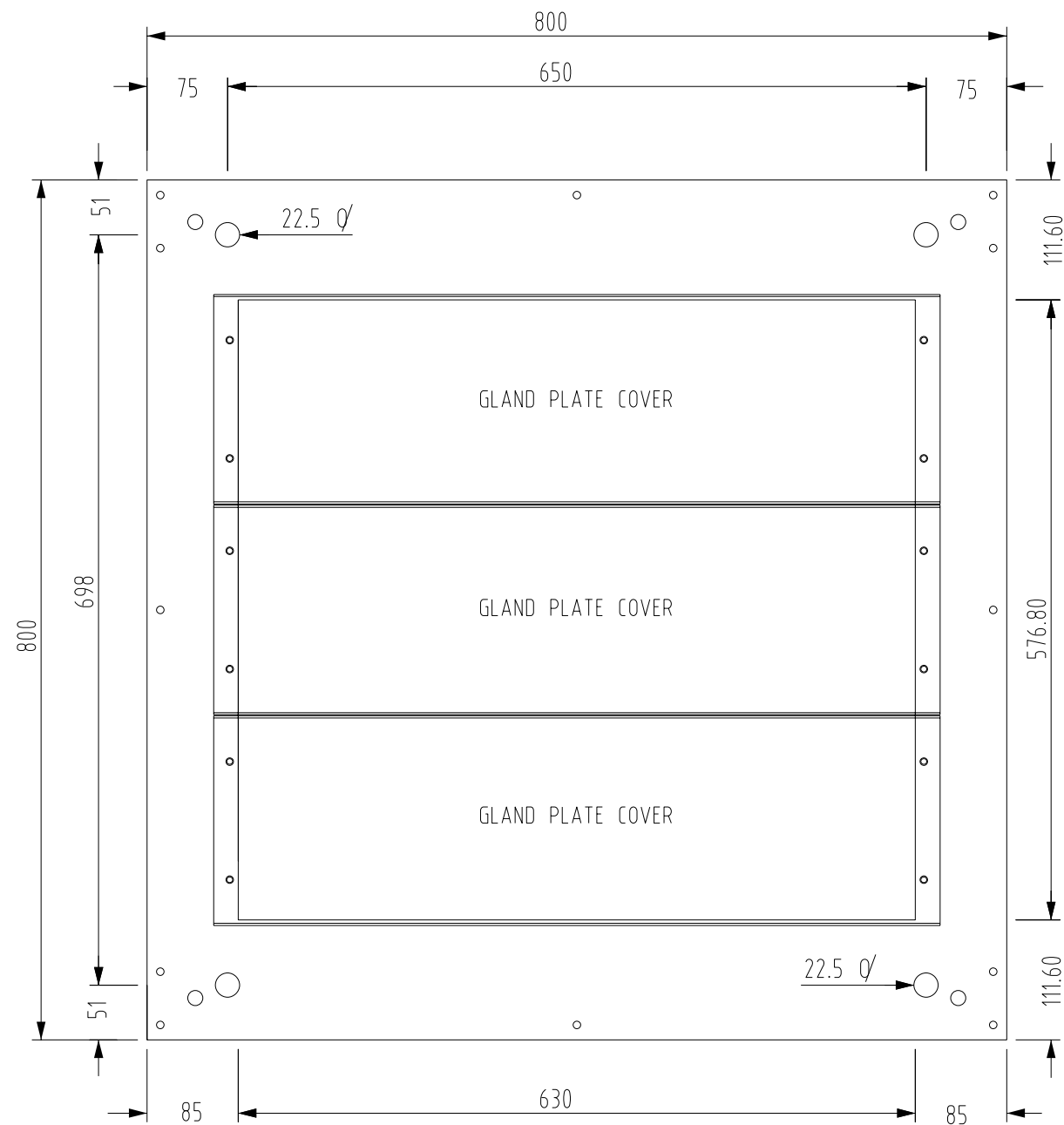
G	AS-BUILT BY _____ DATE _____		CONTRACT NO. 11131113/00		JOB ORDER NO. S-13656		ASSEMBLY DRAWING		<div>نقل الكهرباء</div> <div>الشركة الوطنية لنقل الكهرباء</div> <div>National Grid sa</div> <div></div>									
				DRAWN BY RIZ		CHECKED BY JKR		SAS INTERFACE PANEL +SAS I/F-2		INDEX	PLANT NO.	DRAWING NUMBER		SHEET NO.		REV. NO.		
	00	13 20	FOR APPROVAL		DATE STARTED 15.3.2013		DATE COMPLETED _____		S/S 8709	S-13656		P	C421	CD-322987		SHT	CONT.	00
	REV. NO.	DATE	DESCRIPTION		OPRG. DEPT. CTPD		ENG. DEPT. AUT-PSAC		RIYADH		SAUDI ARABIA					G02	G03	

NG/D2-D (2012/01)

DMS VECTOR NGD200

BASE PLATE/
FOUNDATION

PLAN



AS-BUILT BY _____ DATE _____ CONTRACT NO. 11131113/00 JOB ORDER NO. S-13656

ASSEMBLY DRAWING

الشركة الوطنية لنقل الكهرباء



SAS INTERFACE PANEL +SAS I/F-2

S/S 8709

S-13656

INDEX

PLANT NO.

DRAWING NUMBER

SHEET NO.

REV. NO.

00 13 20

FOR APPROVAL

REV. NO.

DATE

DESCRIPTION

DRAWN BY RIZ CHECKED BY JKR

DATE STARTED 15.3.2013 DATE COMPLETED

OPRG. DEPT. CTPD ENG. DEPT. AUT-PSAC

RIYADH

SAUDI ARABIA

P

C421

CD-322987

G03 G04

00

NG/D2-D (2012/01)

DMS

VECTOR

NGD200

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B

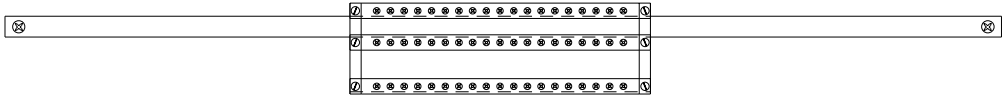
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D

E

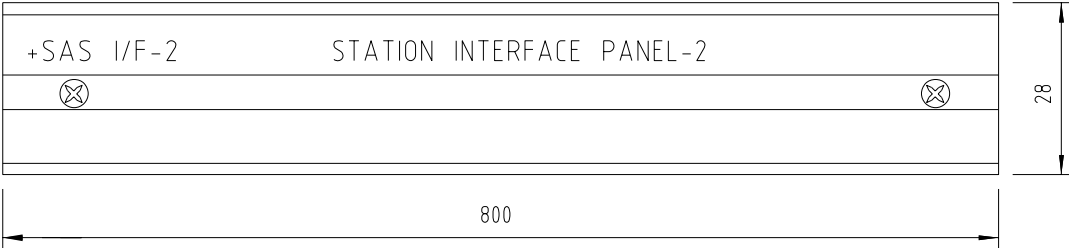
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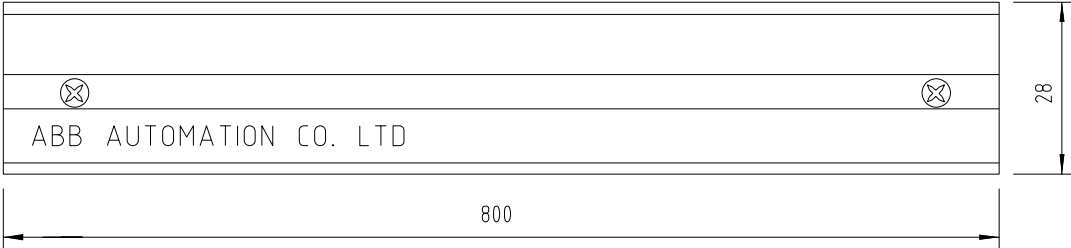


TOP VIEW FOR EARTHING BAR

U PLANE TOP LABEL



U PLANE BOTTOM LABEL



MANUFACTURING LABEL

ABB ABB Automation Co.Ltd.

PROJECT : National Grid SA - S/S 8709

ORDER REFERENCE : 2875 RF S13656

YEAR OF MANUFACTURE : 2013

PANEL NO. : +SAS I/F-2

DRAWING NO. : S13656-CD-322988

MADE IN THE KINGDOM OF SAUDI ARABIA

AS-BUILT BY _____ DATE _____ CONTRACT NO. 11131113/00 JOB ORDER NO. S-13656

			DRAWN BY <u>RIZ</u> CHECKED BY <u>JKR</u>
			DATE STARTED <u>15.3.2013</u> DATE COMPLETED _____
<u>00</u>	<u>13 20</u>	FOR APPROVAL	OPRG. DEPT. <u>CTPD</u> ENG. DEPT. <u>AUT-PSAC</u>
REV. NO.	DATE	DESCRIPTION	

ASSEMBLY DRAWING

SAS INTERFACE PANEL +SAS I/F-2

S/S 8709

S-13656

RIYADH

SAUDI ARABIA

الشركة الوطنية لنقل الكهرباء





INDEX	PLANT NO.	DRAWING NUMBER	SHEET NO.	REV. NO.
P	C421	CD-322987	SHT G04	CONT. L00
				00

NG/D2-D (2012/01)

DMS

VECTOR


NGD200





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C	CONTRACTOR : ABB Contracting Company									
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E	PROJECT : CONSTRUCTION OF NEW 132/13.8kV SS 8709 IN AL-KHARJ CITY									
F	SUBSTATION : S/S 8709									
	CONTRACT NO. : 11131113/00									
	TITLE : LIST OF APPARATUS +SAS I/F-2									
G	AS-BUILT BY _____ DATE _____		CONTRACT NO. 11131113/00		JOB ORDER NO. S-13656		COVER SHEET		<div>الشركة الوطنية لنقل الكهرباء</div> <div> نقل الكهرباء National Grid sa</div>	
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	00	13 20	DATE STARTED 15.3.2013 DATE COMPLETED		RIYADH SAUDI ARABIA		P	C421	CD-322987	L00L01 00
	REV. NO.	DATE	DESCRIPTION		OPRG. DEPT. CTPD ENG. DEPT. AUT-PSAC					

NG/D2-D (2012/01)
DMS VECTOR NGD200

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A	<table><tr><td>SR. NO.</td><td>GA REF.</td><td>SCH. REF.</td><td>D E S C R I P T I O N</td><td>SHEET NO.</td><td>QTY.</td><td>TYPE</td><td>MAKE</td><td>ORDERING INFORMATION</td><td>COUNTRY OF ORIGIN</td></tr><tr><td></td><td></td><td></td><td>STATION INTERFACE PANEL-1</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>1</td><td>U05.5001</td><td>A2</td><td>STATION COMMON ALARM SWITCHING EQUIPMENT WITH FOLLOWING SPECIFICATION</td><td>291 TO 296</td><td>1</td><td>REC 670</td><td>ABB</td><td>1MRK 002814-AC</td><td>SWEDEN</td></tr><tr><td></td><td></td><td></td><td>AUX : EL=90-250V DC</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td>FREQ : 50/60HZ</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td>BINARY INPUT : 14 NOS(PER CARD 16 INPUTS RL=110-125DC)</td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td rowspan="2">B</td><td>2</td><td>U11.101</td><td>TS-1</td><td>TEST SWITCH FOR REC 670 (A1)</td><td>245</td><td>1</td><td>RTXP18</td><td>ABB</td><td>RK 926 115-AN</td><td>SWEDEN</td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td rowspan="4">C</td><td>3</td><td>U27.101</td><td>74IF</td><td>DUAL TARGET RELAY (REVERSE FLAG) (A1 DC FAIL/SPARE) CONTACTS :1NO+2NC PER COIL AUX.VOLT :1NO+2NC PER COIL FLAG :SELF RESET</td><td>245</td><td>1</td><td>RXSF1</td><td>ABB</td><td>RK 271 019 AN</td><td>SWEDEN</td></tr><tr><td>4</td><td></td><td></td><td>MCB 2 POLE 6A, FOR DC SUPPLY WITH 2NC AUXILIARY CONTACT</td><td>216</td><td>1</td><td>S 282 UC-K6 S2-H02</td><td>ABB</td><td>GH S282 0164 R0377 GH S270 1916 R0003</td><td>GERMANY</td></tr><tr><td></td><td>U39.5001</td><td>Q1</td><td>Q1 IF+ SUPPLY</td><td></td><td></td><td></td><td></td><td></td><td>FRANCE</td></tr><tr><td>5</td><td>U39.5002</td><td>C01 C02</td><td>CONVENIENCE OUTLET 10A, 127V AC CONVENIENCE OUTLET 10A, 220V AC</td><td>211</td><td>1</td><td>USM45 & USMS45</td><td>LEGRAND</td><td>74140 & 74180</td><td></td></tr><tr><td rowspan="4">D</td><td></td><td></td><td>C1,C2</td><td>MINIATURE CIRCUIT BREAKER, 2 POLE, 10A FOR CONVENIENCE OUTLET WITH AUXILIARY SWITCH, 1NO + 1NC CONTACTS</td><td>211</td><td>2</td><td>S202-C10 S2C-H11L</td><td>ABB</td><td>2CDS 253 001 R0104 2CDS 200 936 R0001</td><td>GERMANY</td></tr><tr><td>6</td><td></td><td>C3</td><td>THERMOSTAT FOR SPACE HEATER, 5-60 C</td><td>211</td><td>1</td><td>SK 3110</td><td>RITTAL</td><td>SK 3110</td><td>THIWAN</td></tr><tr><td>7</td><td>U39.5003</td><td>TJ</td><td>TELEPHONE JACK 1GANG 4WIRE</td><td>211</td><td>1</td><td>EDF410</td><td>EDISON</td><td>EDF410</td><td>SWEDEN</td></tr><tr><td>8</td><td></td><td>C7</td><td>ON/OFF SWITCH FOR SPACE HEATER</td><td>211</td><td>1</td><td>M2SS1-10B MCBH-10</td><td>ABB</td><td>1SFA 611 200 R1006 1SFA 611 605 R1101</td><td></td></tr><tr><td rowspan="3">E</td><td>9</td><td></td><td>DS</td><td>DOOR SWITCH FOR CONTROL OF CUBICLE INTERNAL ILLUMINATION LAMP</td><td>211</td><td>1</td><td>LS30P</td><td>ABB</td><td>1SBV 010213 R1202</td><td>SWEDEN</td></tr><tr><td>10</td><td></td><td></td><td>INTERNAL ILLUMINATION CUBICLE LAMP SUITABLE FOR 127V AC, 60Hz SUPPLY, 20W</td><td>211</td><td>1</td><td>T-4</td><td>SUNON</td><td>SP-20W</td><td></td></tr><tr><td>11</td><td></td><td>SH</td><td>SPACE HEATER, 150w, 120V, 60Hz</td><td>211</td><td>1</td><td>MICA</td><td>GRUPPO</td><td>1FZEK 006 C001</td><td>ITALY</td></tr><tr><td rowspan="4">F</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td rowspan="4">G</td><td colspan="3">AS-BUILT BY _____ DATE _____</td><td>CONTRACT NO. 11131113/00</td><td colspan="2">JOB ORDER NO. S-13656</td><td colspan="4">LIST OF APPARATUS</td></tr><tr><td></td><td></td><td></td><td colspan="2">DRAWN BY RIZ CHECKED BY JKR</td><td colspan="2">SAS INTERFACE PANEL +SAS I/F-2</td><td colspan="3">الشركة الوطنية لنقل الكهرباء National Grid sa</td></tr><tr><td>00</td><td>13 20</td><td>FOR APPROVAL</td><td colspan="2">DATE STARTED 15.3.2013 DATE COMPLETED _____</td><td colspan="2">S/S 8709 S-13656</td><td>INDEX</td><td>PLANT NO.</td><td>DRAWING NUMBER</td><td>SHEET NO. SHT CONT.</td><td>REV. NO.</td></tr><tr><td>REV. NO.</td><td>DATE</td><td>DESCRIPTION</td><td colspan="2">OPRG. DEPT. CTPD ENG. DEPT. AUT-PSAC</td><td colspan="2">RIYADH SAUDI ARABIA</td><td>P</td><td>C421</td><td>CD-322987</td><td>L01 L02</td><td>00</td></tr></table>										SR. NO.	GA REF.	SCH. REF.	D E S C R I P T I O N	SHEET NO.	QTY.	TYPE	MAKE	ORDERING INFORMATION	COUNTRY OF ORIGIN				STATION INTERFACE PANEL-1							1	U05.5001	A2	STATION COMMON ALARM SWITCHING EQUIPMENT WITH FOLLOWING SPECIFICATION	291 TO 296	1	REC 670	ABB	1MRK 002814-AC	SWEDEN				AUX : EL=90-250V DC										FREQ : 50/60HZ										BINARY INPUT : 14 NOS(PER CARD 16 INPUTS RL=110-125DC)							B	2	U11.101	TS-1	TEST SWITCH FOR REC 670 (A1)	245	1	RTXP18	ABB	RK 926 115-AN	SWEDEN										C	3	U27.101	74IF	DUAL TARGET RELAY (REVERSE FLAG) (A1 DC FAIL/SPARE) CONTACTS :1NO+2NC PER COIL AUX.VOLT :1NO+2NC PER COIL FLAG :SELF RESET	245	1	RXSF1	ABB	RK 271 019 AN	SWEDEN	4			MCB 2 POLE 6A, FOR DC SUPPLY WITH 2NC AUXILIARY CONTACT	216	1	S 282 UC-K6 S2-H02	ABB	GH S282 0164 R0377 GH S270 1916 R0003	GERMANY		U39.5001	Q1	Q1 IF+ SUPPLY						FRANCE	5	U39.5002	C01 C02	CONVENIENCE OUTLET 10A, 127V AC CONVENIENCE OUTLET 10A, 220V AC	211	1	USM45 & USMS45	LEGRAND	74140 & 74180		D			C1,C2	MINIATURE CIRCUIT BREAKER, 2 POLE, 10A FOR CONVENIENCE OUTLET WITH AUXILIARY SWITCH, 1NO + 1NC CONTACTS	211	2	S202-C10 S2C-H11L	ABB	2CDS 253 001 R0104 2CDS 200 936 R0001	GERMANY	6		C3	THERMOSTAT FOR SPACE HEATER, 5-60 C	211	1	SK 3110	RITTAL	SK 3110	THIWAN	7	U39.5003	TJ	TELEPHONE JACK 1GANG 4WIRE	211	1	EDF410	EDISON	EDF410	SWEDEN	8		C7	ON/OFF SWITCH FOR SPACE HEATER	211	1	M2SS1-10B MCBH-10	ABB	1SFA 611 200 R1006 1SFA 611 605 R1101		E	9		DS	DOOR SWITCH FOR CONTROL OF CUBICLE INTERNAL ILLUMINATION LAMP	211	1	LS30P	ABB	1SBV 010213 R1202	SWEDEN	10			INTERNAL ILLUMINATION CUBICLE LAMP SUITABLE FOR 127V AC, 60Hz SUPPLY, 20W	211	1	T-4	SUNON	SP-20W		11		SH	SPACE HEATER, 150w, 120V, 60Hz	211	1	MICA	GRUPPO	1FZEK 006 C001	ITALY	F																																									G	AS-BUILT BY _____ DATE _____			CONTRACT NO. 11131113/00	JOB ORDER NO. 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B	SR. NO.	ITEM DESIGNATION	D E S C R I P T I O N		SHEET.NO.	QTY.	TYPE	MAKE	ORDERING INFORMATION	COUNTRY OF ORIGIN			
	11	X3	SPRING LOADED TERMINAL BLOCKS FOR DISCONNECTABLE AC CIRCUITS		301	10	D6/8.ST1.RS	ENTRELEC	1SNA 115 831 R0400	FRANCE			
		X4	SPRING LOADED TERMINAL BLOCK FOR DISCONNECTABLE DC CIRCUITS		301,302	5	D6/8.ST1.RS	ENTRELEC	1SNA 115 831 R0400	FRANCE			
		X41,X42	SPRING LOADED TERMINAL BLOCK FOR DISCONNECTABLE DC CIRCUITS		301,302	50,50	D6/8.ST1.RS	ENTRELEC	1SNA 115 831 R0400	FRANCE			
		X43				50							
		X51,X52	SPRING LOADED TERMINAL BLOCK FOR DC PROTN. CIRCUITS		301,302	90,90	M6/8.RS	ENTRELEC	1SNA 115 688 R2500	FRANCE			
		X53				90							
		X61,X6	KNIFE TYPE TERMINAL BLOCKS FOR COMMON ALARM CIRCUITS		302	10,5	M6/8.SNB	ENTRELEC	1SNA 115 685 R1200	FRANCE			
		XTJ	SPRING LOADED TERMINAL BLOCKS FOR TELEPHONE JACK		302	5	M6/8.RS	ENTRELEC	1SNA 115 688 R2500	FRANCE			
		XSH	SPRING LOADED TERMINAL BLOCKS FOR SPACE HEATER		302	3	M6/8.RS	ENTRELEC	1SNA 115 688 R2500	FRANCE			
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G	AS-BUILT BY _____ DATE _____		CONTRACT NO. 11131113/00		JOB ORDER NO. S-13656		LIST OF APPARATUS		<div>الشركة الوطنية لنقل الكهرباء</div> <div>نقل الكهرباء</div> <div>National Grid sa</div>				
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	00	13 20	FOR APPROVAL		DATE STARTED 15.3.2013 DATE COMPLETED _____		S/S 8709 S-13656		INDEX	PLANT NO.	DRAWING NUMBER	SHEET NO.	REV. NO.
	REV. NO.	DATE	DESCRIPTION		OPRG. DEPT. CTPD ENG. DEPT. AUT-PSAC		RIYADH SAUDI ARABIA		P	C421	CD-322987	SHT L02	CONT. L03

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			DRAWN BY <u>RIZ</u> CHECKED BY <u>JKR</u>		SAS INTERFACE PANEL +SAS I/F-2						
			DATE STARTED <u>15.3.2013</u> DATE COMPLETED _____		S/S 8709 S-13656						
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	REV. NO.	DATE	DESCRIPTION		OPRG. DEPT. <u>CTPD</u> ENG. DEPT. <u>AUT-PSAC</u>		INDEX	PLANT NO.	DRAWING NUMBER	SHEET NO. SHT CONT.	REV. NO.
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A			POWER SYSTEMS NETWORK MANAGEMENT PROTECTION AND SUBSTATION AUTOMATION SYSTEMS WBS NO: S-13656					ABB AUTOMATION COMPANY LTD., 414, AL-KHARJ ROAD SECOND INDUSTRIAL CITY RIYADH-11383 K.S.A																																																																																												
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D	CONTRACTOR : ABB Contracting Company																																																																																																			
	CLIENT : National Grid SA																																																																																																			
	PROJECT : CONSTRUCTION OF NEW 132/13.8kV SS 8709 IN AL-KHARJ CITY																																																																																																			
	SUBSTATION : S/S 8709																																																																																																			
E	CONTRACT NO. : 11131113/00																																																																																																			
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		CURRENT TRANSFORMER WITH TWO CORES (MULTI-LINE AND SINGLE-LINE REPRESENTATION)		Wh	WATT-HOUR METER		LOGIC IDENTITY ELEMENT WITH THREE INPUTS																																																																																																																																																					
		CURRENT TRANSFORMER WITH TWO SECONDARY WINDINGS ON ONE CORE (MULTI-LINE AND SINGLE-LINE REPRESENTATION)		Wh	WATT-HOUR METER FOR ENERGY FROM A BUSBAR SYSTEM		MAJORITY ELEMENT WITH THREE INPUTS																																																																																																																																																					
		FILTER			ELEMENT WITH STATIC INPUT		NEGATOR																																																																																																																																																					
		HIGH-PASS FILTER			ELEMENT WITH STATIC NEGATED INPUT		NAND ELEMENT WITH TWO INPUTS																																																																																																																																																					
		BAND-PASS FILTER			ELEMENT WITH STATIC NEGATED OUTPUT		NOR ELEMENT WITH TWO INPUTS																																																																																																																																																					
		VOLTMETER			ELEMENT WITH DYNAMIC INPUT		BISTABLE ELEMENT																																																																																																																																																					
		AMMETER			ELEMENT WITH DYNAMIC NEGATED INPUT																																																																																																																																																							
					ELEMENT WITH INHIBITING INPUT																																																																																																																																																							
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B											
C											
D											
E											

LEGENDS

±R1

±R2

±R3

±IT

FL

BB RS±

BB CBF±/CBF±

DC SUPPLY - MAIN PROTECTION

DC SUPPLY - SECONDARY PROTECTION

DC SUPPLY - BACK UP PROTECTION

DC SUPPLY - INTER TRIP

DC SUPPLY - FLASHING CIRCUIT

DC SUPPLY - BUS BAR - PROTECTION RESET

DC SUPPLY - CBF PROTECTION

R

CR

ECC

LOCAL

REMOTE

RESET BUS - ALARM SYSTEM

CONTROL ROOM

ENERGY CONTROL CENTRE

THE LOCATION OF CONTROLLED DEVICE

ANY OTHER LOCATION NOT LOCAL

ON

OFF

A

T

S

CS

CT

LS

LT

LC

LO

RO

CB NORMALLY OPEN AUXILIARY CONTACT

CB NORMALLY CLOSED AUXILIARY CONTACT

COMMON

TEST POSITION

SERVICE POSITION

CLOSE IN SERVICE POSITION

CLOSE IN TEST POSITION

LOCAL SERVICE

LOCAL TEST

LOCAL CLOSE

LOCAL OPEN

REMOTE OPEN

NOTES

LABELS

WHITE LABEL WITH BLACK LETTERING WILL BE PROVIDED FOR ALL MOUNTED APPARATUS EQUIPMENT IDENTIFICATION AND FUNCTION REFERENCE LABEL WILL BE PROVIDED FOR FRONT MOUNTED EQUIPMENTS OF THE PANEL AND EQUIPMENT IDENTIFICATION LABEL WILL BE PROVIDED FOR INTERNALLY MOUNTED EQUIPMENTS

WIRING

PVC INSULATED 600V GRADE

2.5 SQ.mm. YELLOW COLOURED FOR CT CIRCUITS

2.5 SQ.mm. RE COLOURED FOR VT CIRCUITS

1.5 SQ.mm. GREY COLOURED FOR DC SUPPLY, SCADA AND CONTROL CIRCUITS

1.5 SQ.mm. BLUE COLOURED FOR COMMON ALARM SIGNALS

2.5 SQ.mm. BLACK COLOURED FOR AVC AND AC CIRCUITS

2.5 SQ.mm. YELLOW/GREEN COLOURED FOR EARTHING CONNECTIONS

FOLLOWING MARKERS SHALL BE PROVIDED ON FOLLOWING WIRES:

+ SIGN FOR DC + WIRE

- SIGN FOR DC - WIRE

LUGS


A. CT CIRCUITS- RING TYPE

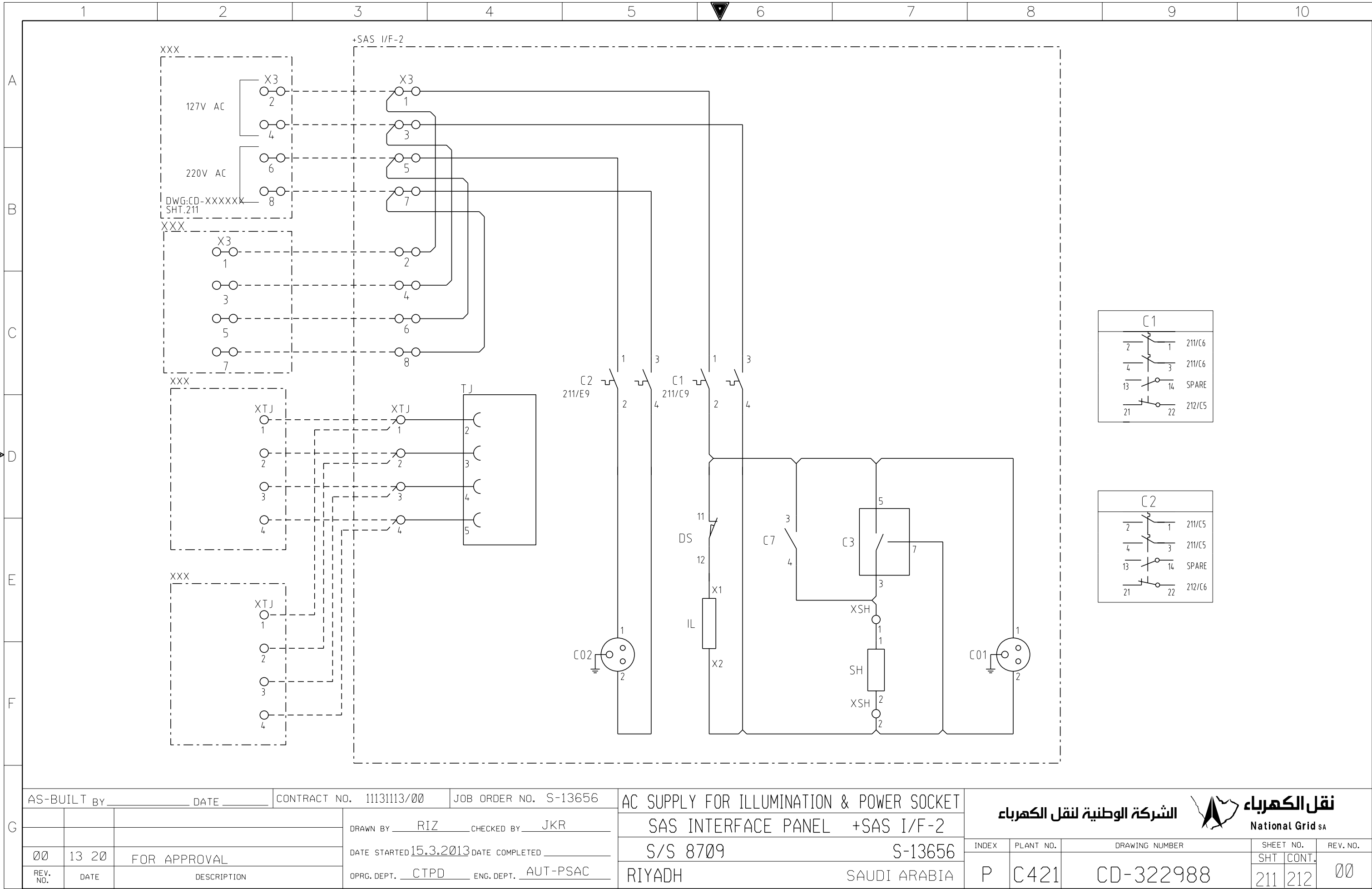
B. OTHER CIRCUITS - SPADE TYPE

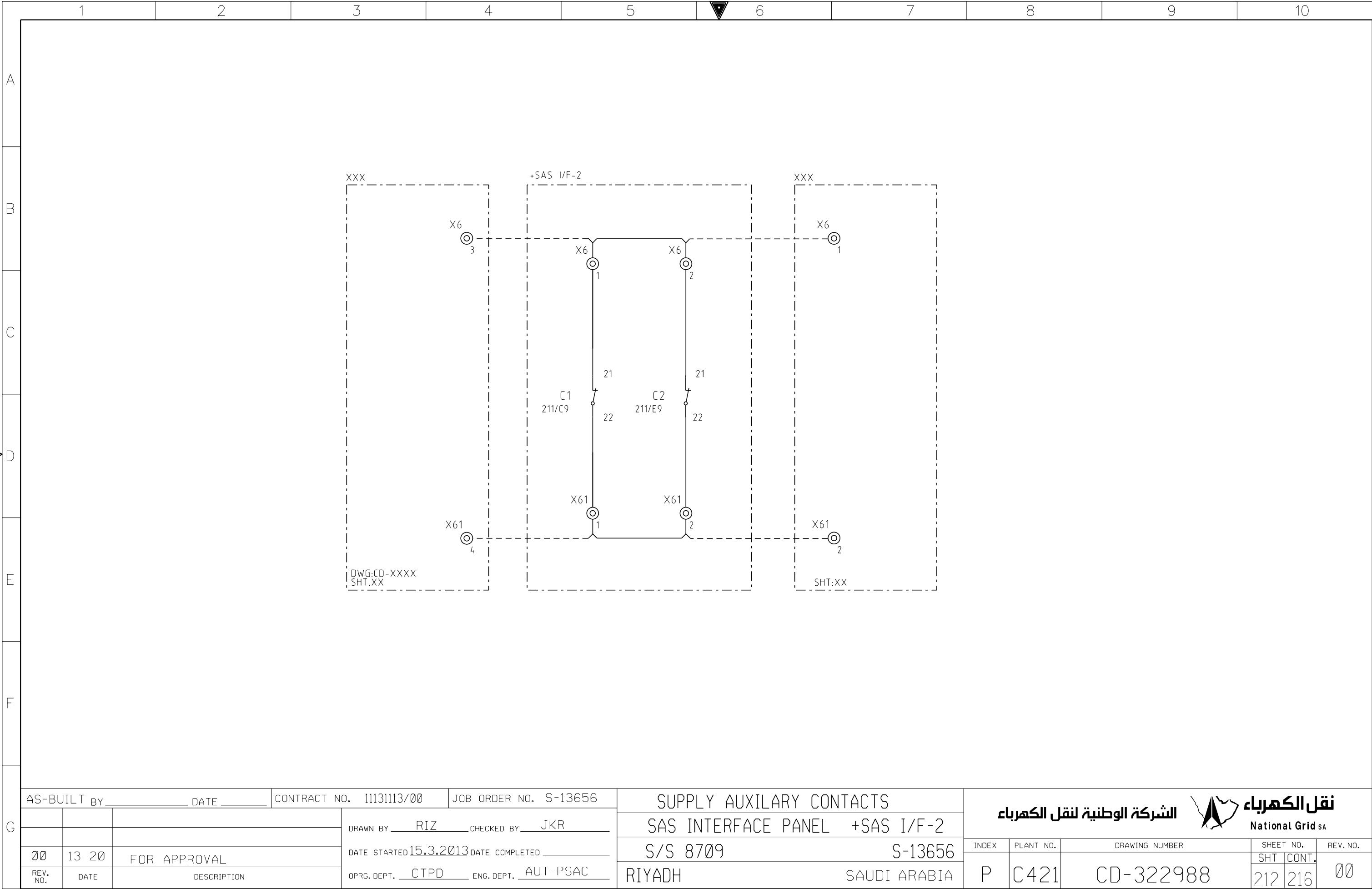
FERULLING

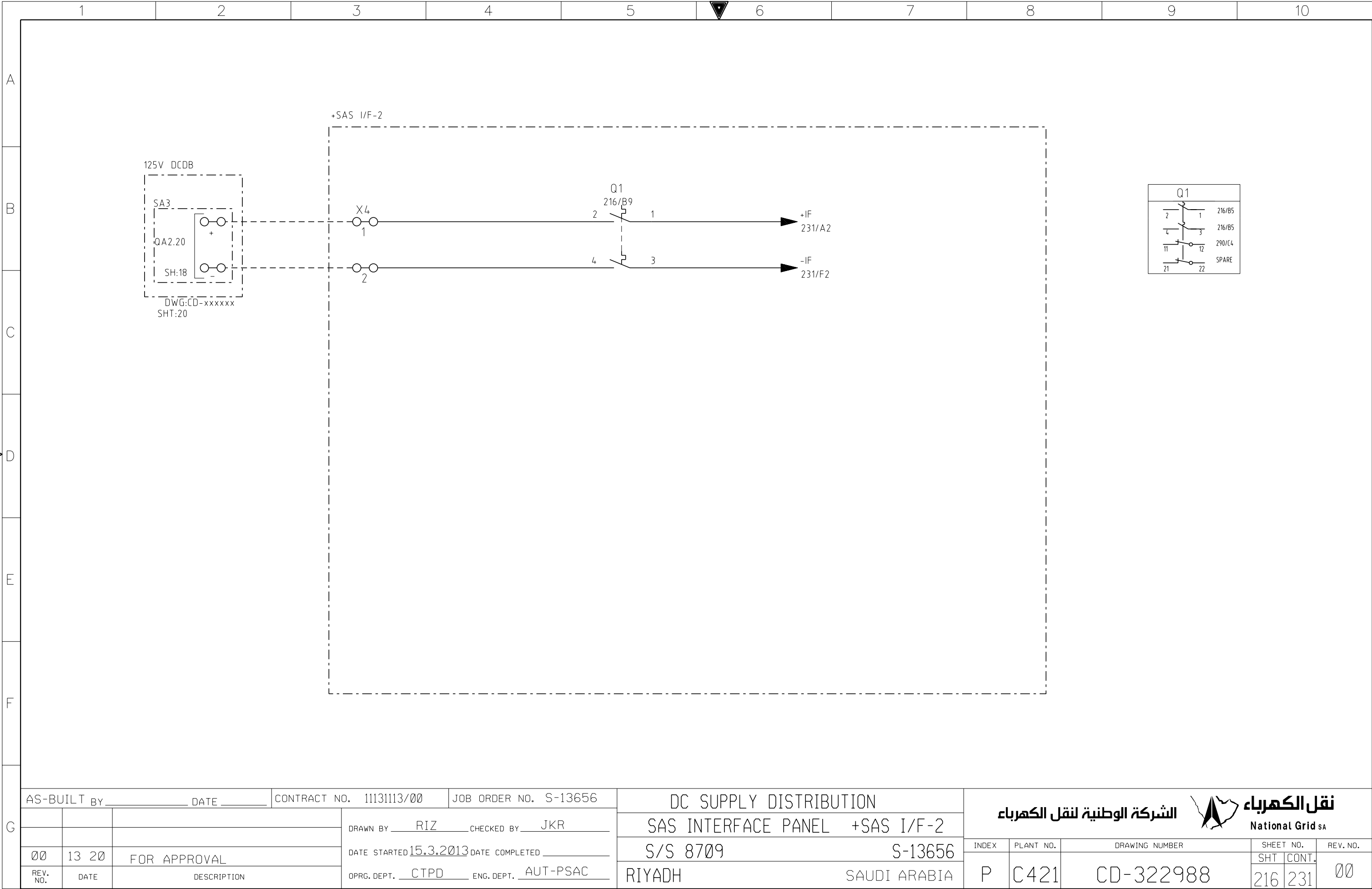
YELLO TUBE 3.2 mm FOR 1.5SQ mm WIRES AND 4.2 FOR 2.5 SQ mm WIRES (AS PER 31 - TMSS-1, RE.0)

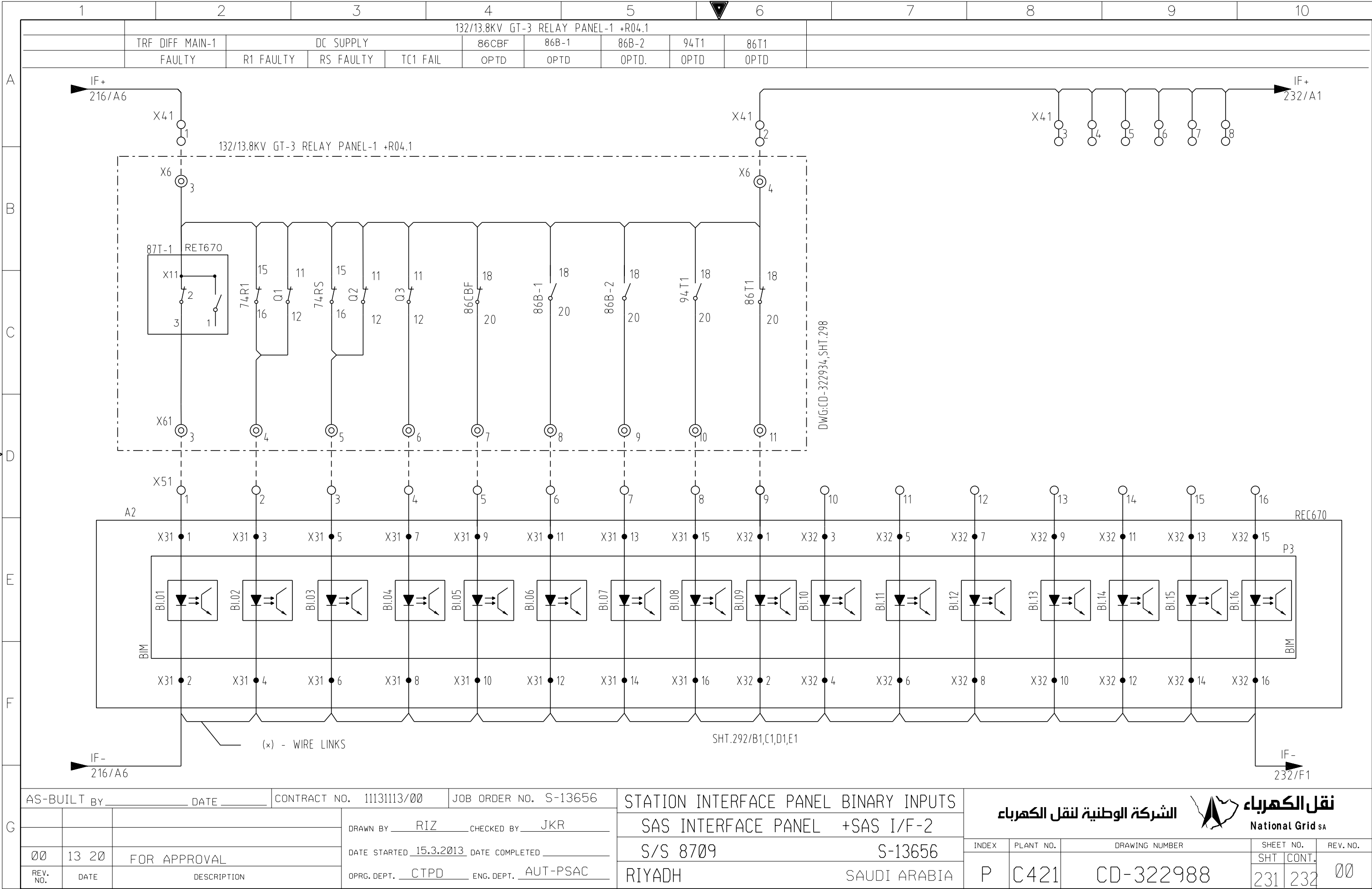
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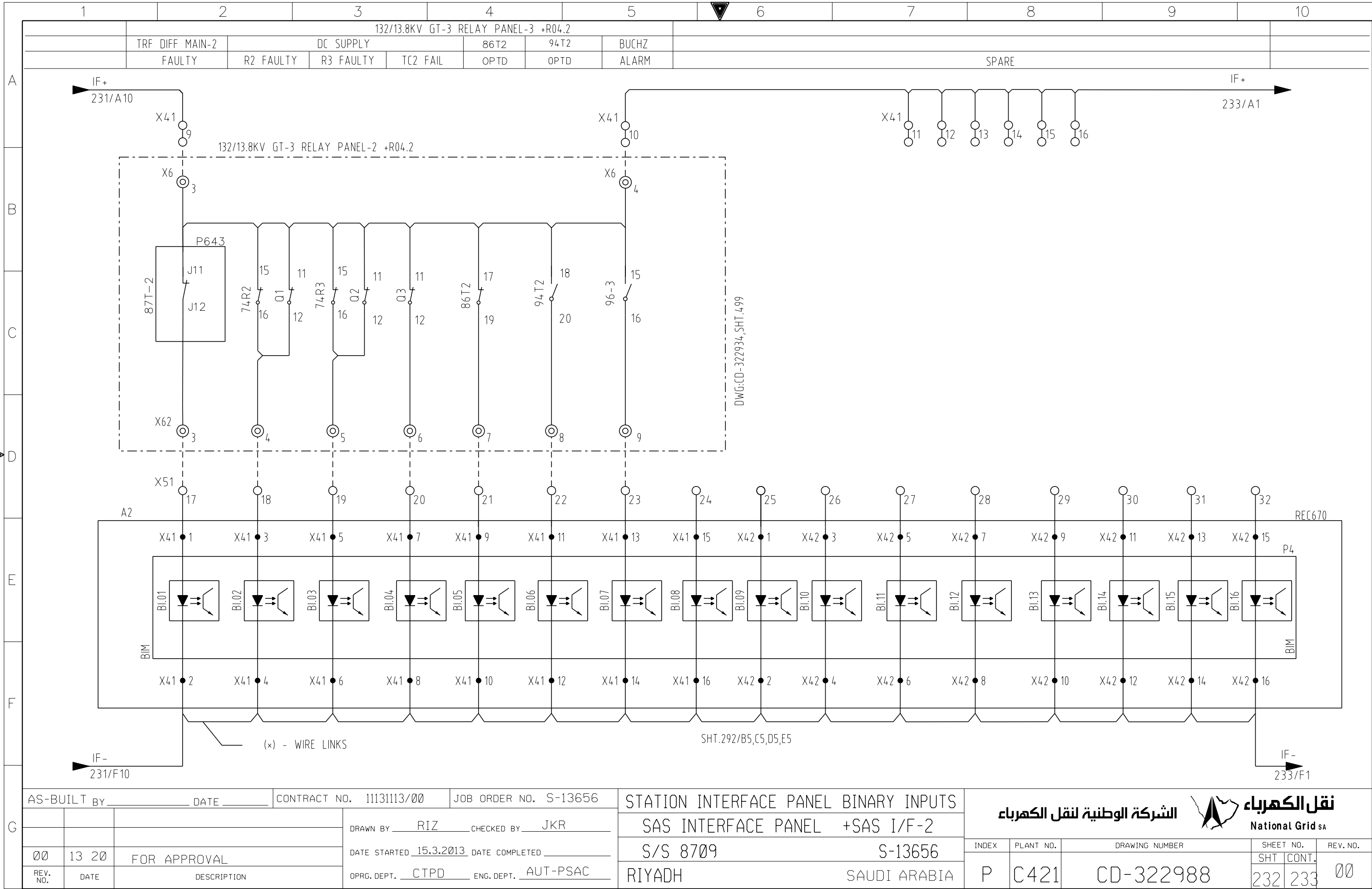
AS-BUILT BY _____ DATE _____			CONTRACT NO. 11131113/00		JOB ORDER NO. S-13656		COMMON LEGENDS			<div>الشركة الوطنية لنقل الكهرباء</div> <div> نقل الكهرباء National Grid sa</div>								
			DRAWN BY <u>RIZ</u> CHECKED BY <u>JKR</u>				SAS INTERFACE PANEL +SAS I/F-2			INDEX		PLANT NO.	DRAWING NUMBER		SHEET NO.		REV. NO.	
00	13 20	FOR APPROVAL	DATE STARTED <u>15.3.2013</u> DATE COMPLETED _____				S/S 8709 S-13656					P	C421	CD-322988		SHT	CONT.	00
REV. NO.	DATE	DESCRIPTION	OPRG. DEPT. <u>CTPD</u> ENG. DEPT. <u>AUT-PSAC</u>				RIYADH SAUDI ARABIA									013	014	

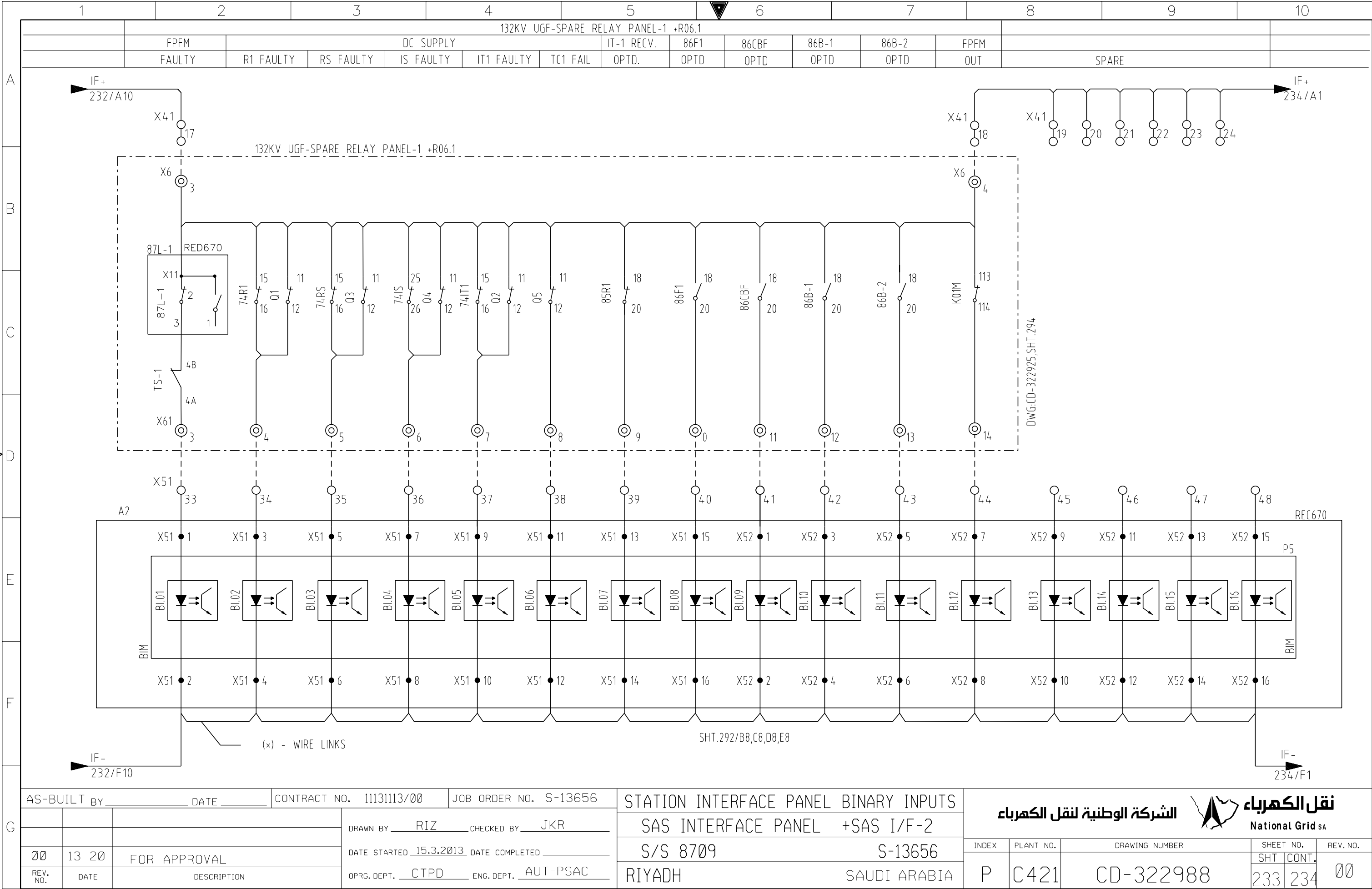


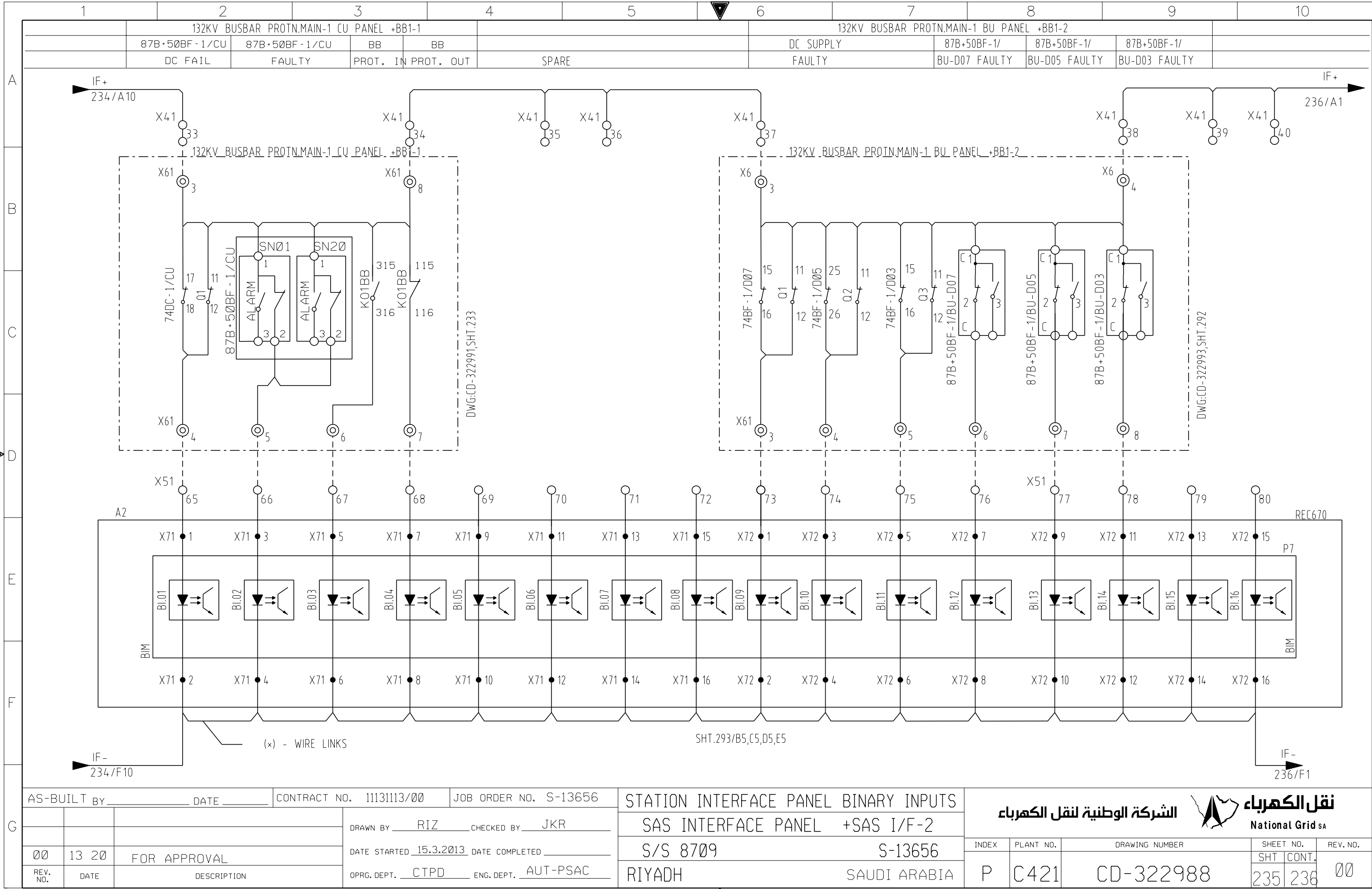


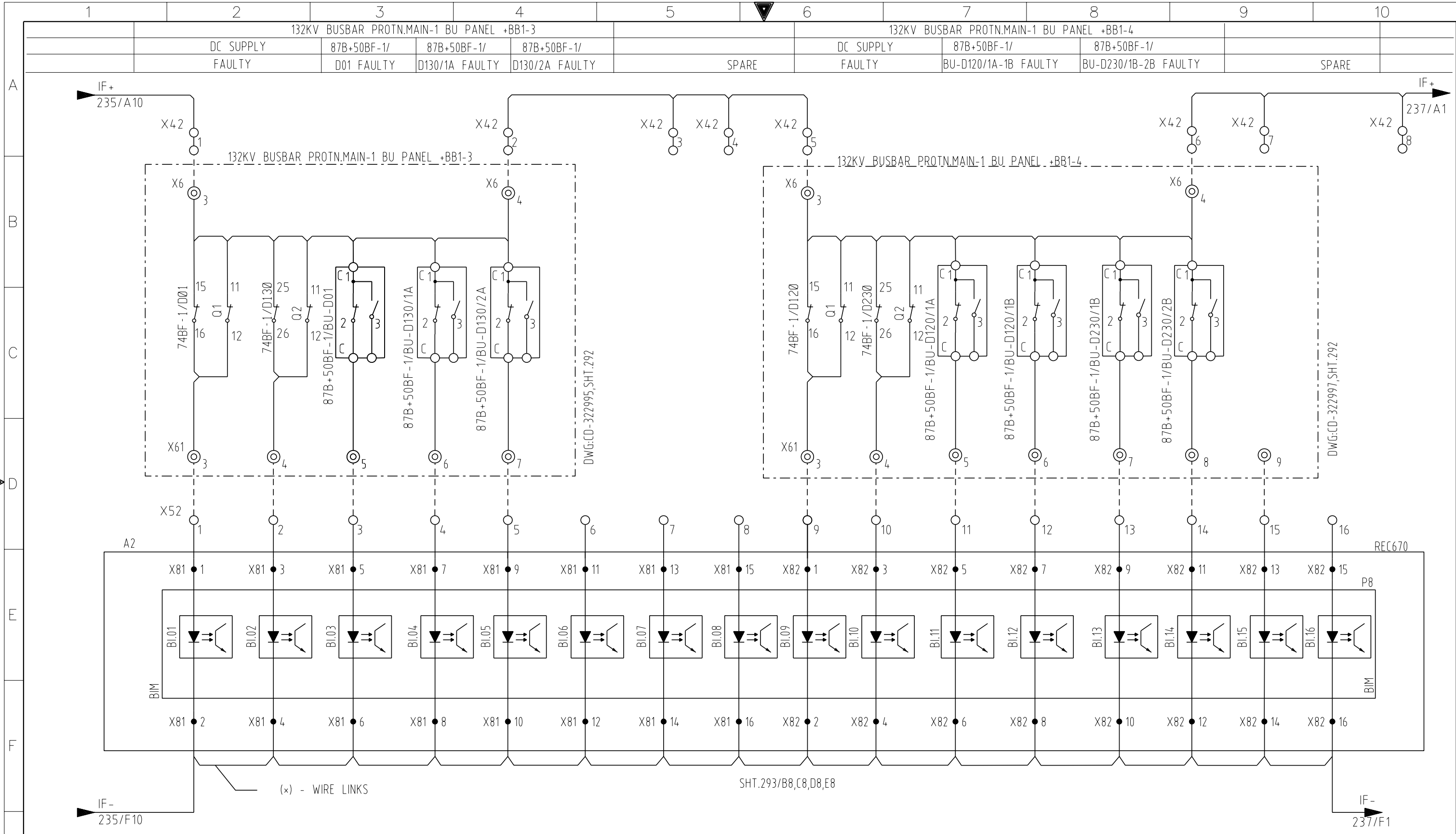




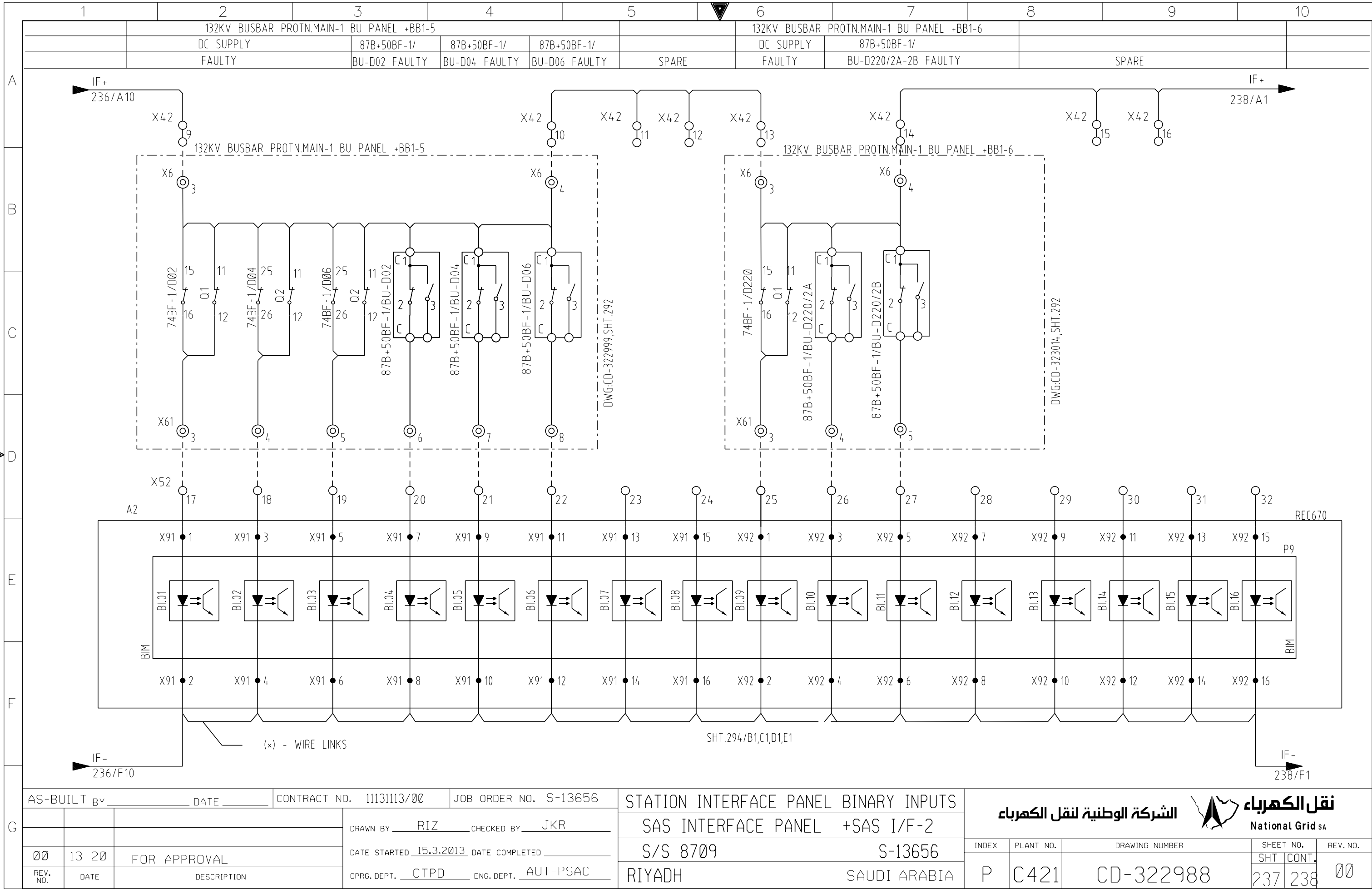


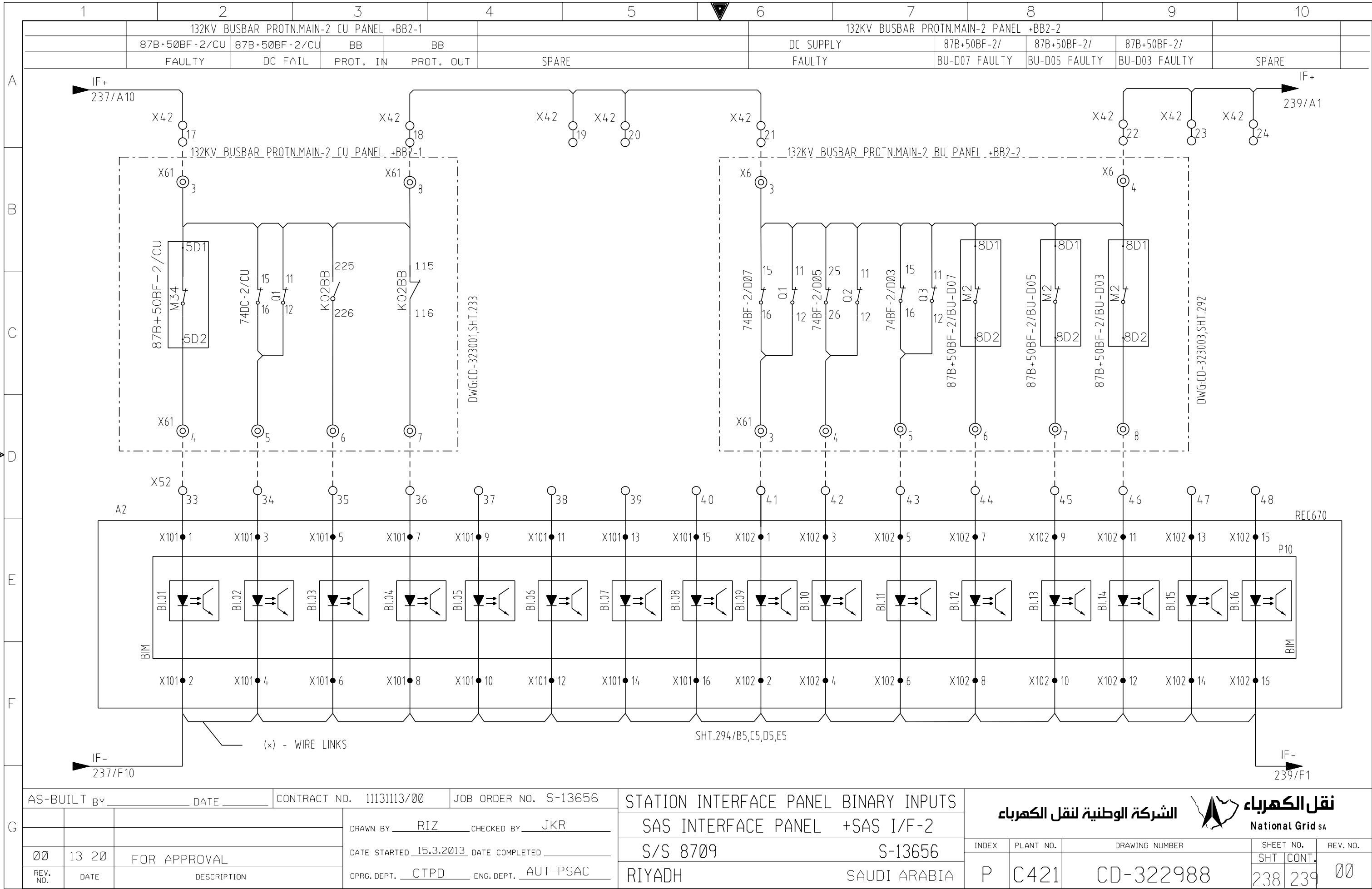






G	AS-BUILT BY _____ DATE _____		CONTRACT NO. 11131113/00		JOB ORDER NO. S-13656		STATION INTERFACE PANEL BINARY INPUTS		<div>نقل الكهرباء</div> <div>الشركة الوطنية لنقل الكهرباء</div> <div>National Grid sa</div>									
				DRAWN BY <u>RIZ</u> CHECKED BY <u>JKR</u>				SAS INTERFACE PANEL +SAS I/F-2										
	00	13 20	FOR APPROVAL		DATE STARTED <u>15.3.2013</u> DATE COMPLETED _____		S/S 8709 S-13656		INDEX		PLANT NO.		DRAWING NUMBER		SHEET NO.		REV. NO.	
	REV. NO.	DATE	DESCRIPTION		OPRG. DEPT. <u>CTPD</u> ENG. DEPT. <u>AUT-PSAC</u>		RIYADH SAUDI ARABIA		P		C421		CD-322988		SHT		CONT.	
															236	237	00	





AS-BUILT BY _____ DATE _____ CONTRACT NO. 11131113/00 JOB ORDER NO. S-13656

00	13 20	FOR APPROVAL
REV. NO.	DATE	DESCRIPTION

DRAWN BY RIZ CHECKED BY JKR

DATE STARTED 15.3.2013 DATE COMPLETED _____

OPRG. DEPT. CTPD ENG. DEPT. AUT-PSAC

STATION INTERFACE PANEL BINARY INPUTS

SAS INTERFACE PANEL +SAS I/F-2

S/S 8709 S-13656

RIYADH SAUDI ARABIA

الشركة الوطنية لنقل الكهرباء

National Grid sa

INDEX

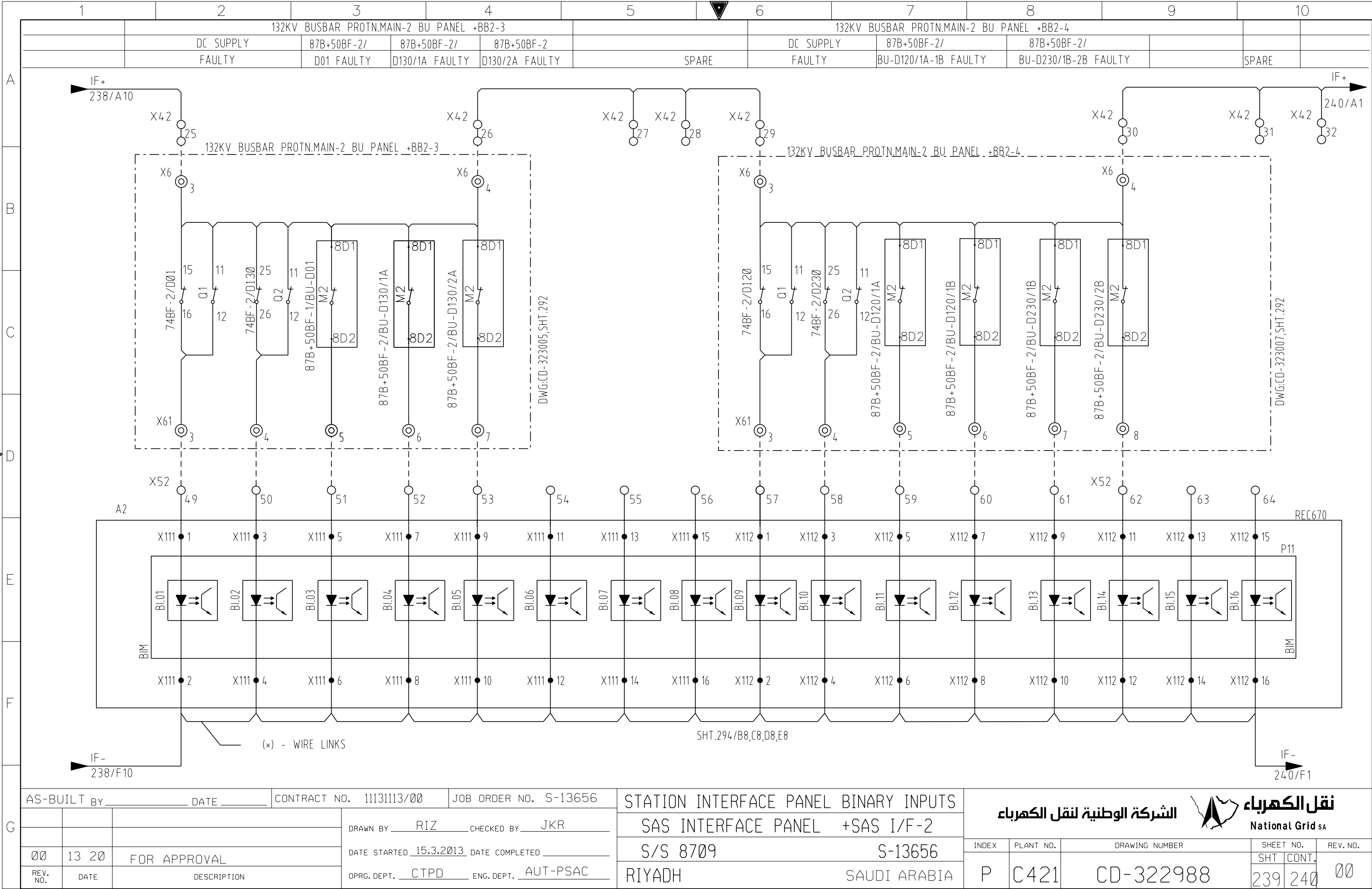
PLANT NO.

DRAWING NUMBER

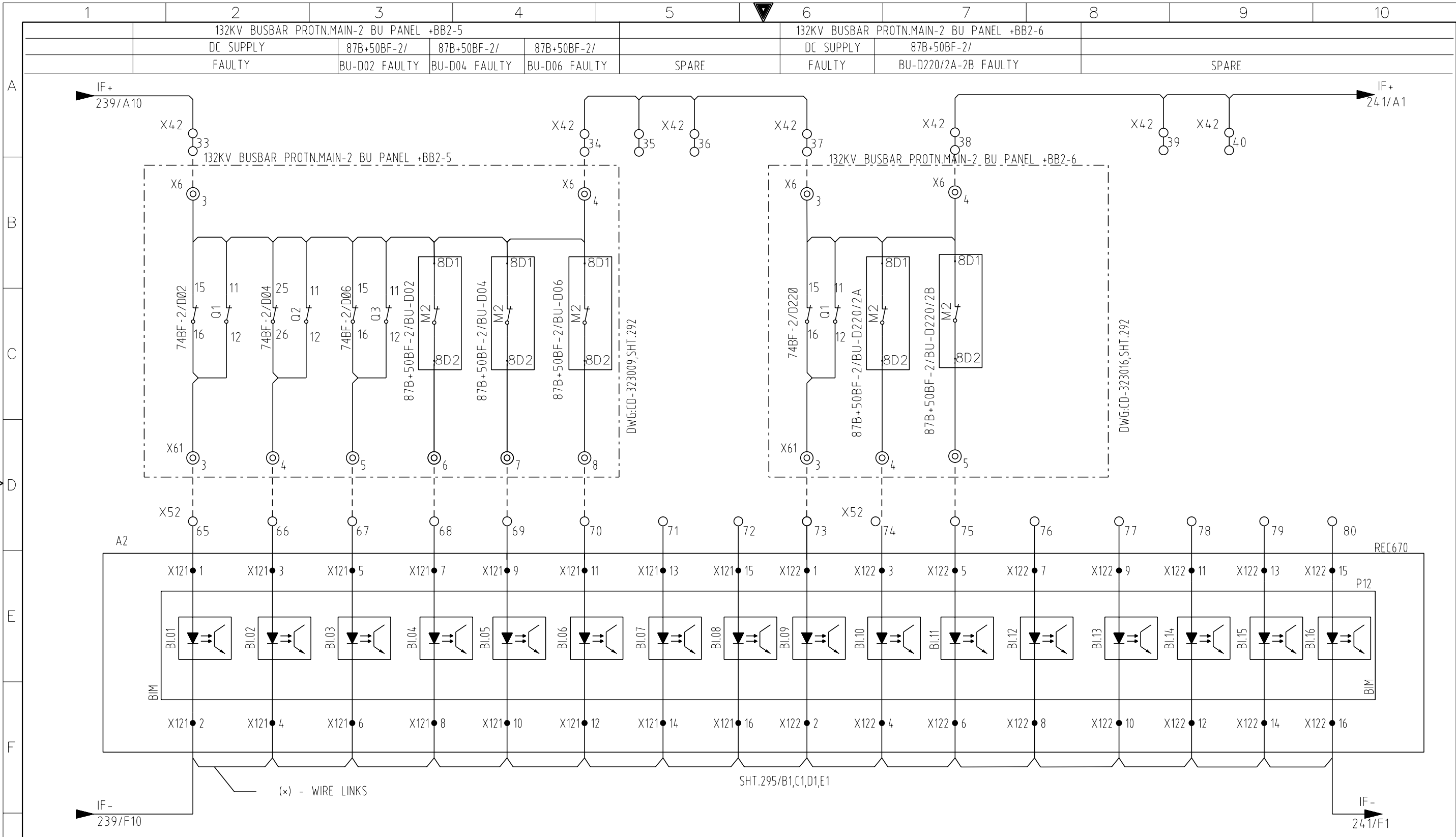
SHEET NO.

REV. NO.

P	C421	CD-322988	238	239	00
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G

AS-BUILT BY _____ DATE _____			CONTRACT NO. 11131113/00		JOB ORDER NO. S-13656	
			DRAWN BY <u> RIZ </u> CHECKED BY <u> JKR </u>			
			DATE STARTED <u>15.3.2013</u> DATE COMPLETED _____			
<u>00</u>	<u>13 20</u>	<u>FOR APPROVAL</u>	OPRG. DEPT. <u>CTPD</u> ENG. DEPT. <u>AUT-PSAC</u>			
REV. NO.	DATE	DESCRIPTION				

STATION INTERFACE PANEL BINARY INPUTS					
SAS INTERFACE PANEL +SAS I/F-2					
S/S 8709			S-13656		
RIYADH			SAUDI ARABIA		

الشركة الوطنية لنقل الكهرباء



National Grid SA

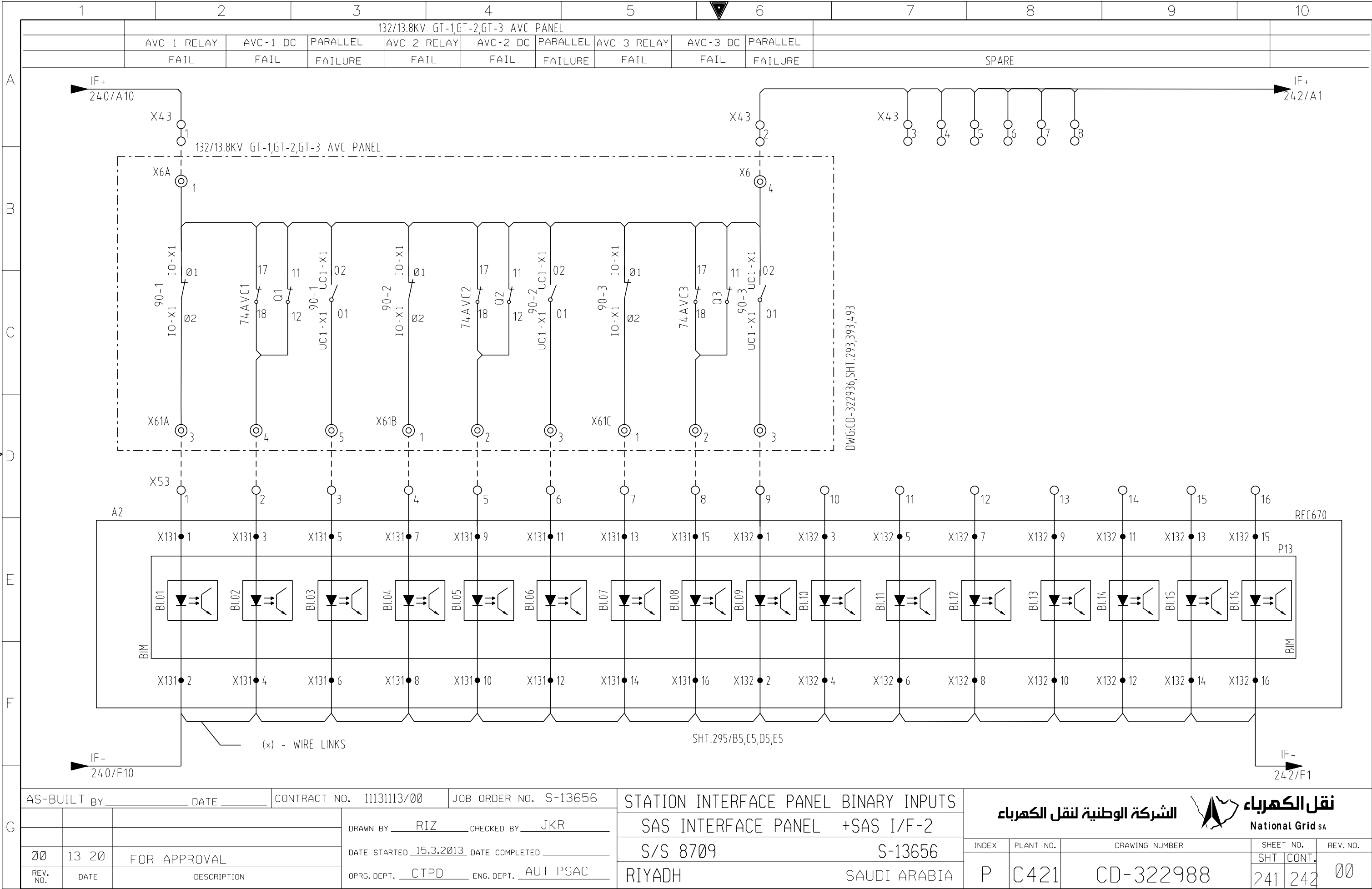
INDEX	PLANT NO.	DRAWING NUMBER	SHEET NO.		REV. NO.
P	C421	CD-322988	SHT	CONT.	00
			240	241	

NG/D2-D (2012/01)

DMS

VECTOR

NGD200



AS-BUILT BY _____ DATE _____ CONTRACT NO. 11131113/00 JOB ORDER NO. S-13656

DRAWN BY RIZ CHECKED BY JKR

DATE STARTED 15.3.2013 DATE COMPLETED _____

OPRG. DEPT. CTPD ENG. DEPT. AUT-PSAC

STATION INTERFACE PANEL BINARY INPUTS

SAS INTERFACE PANEL +SAS I/F-2

S/S 8709

S-13656

RIYADH

SAUDI ARABIA

الشركة الوطنية لنقل الكهرباء



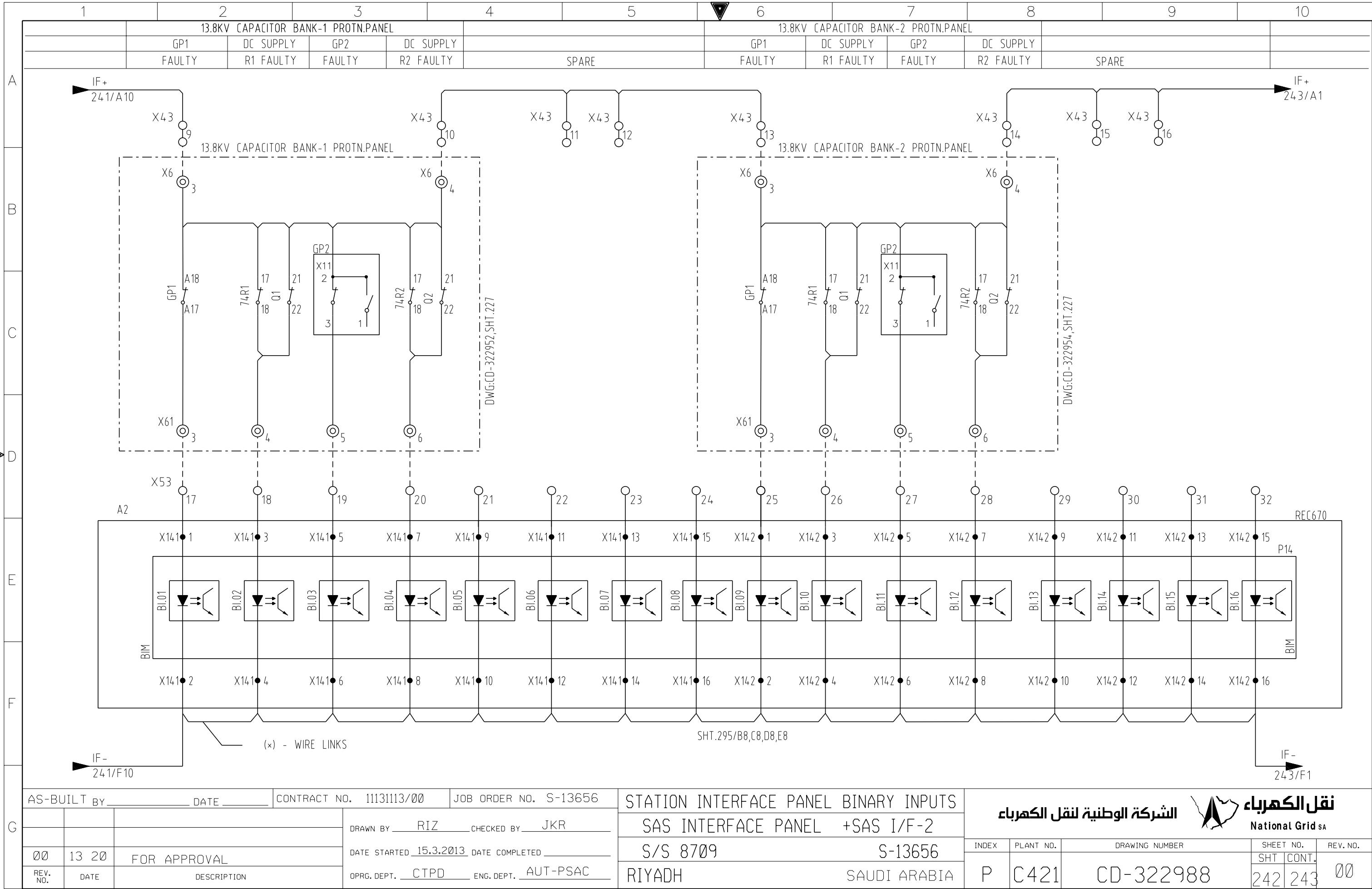
INDEX	PLANT NO.	DRAWING NUMBER	SHEET NO.	REV. NO.
P	C421	CD-322988	SHT 241	CONT. 242
				00

NG/D2-D (2012/01)

DMS

VECTOR

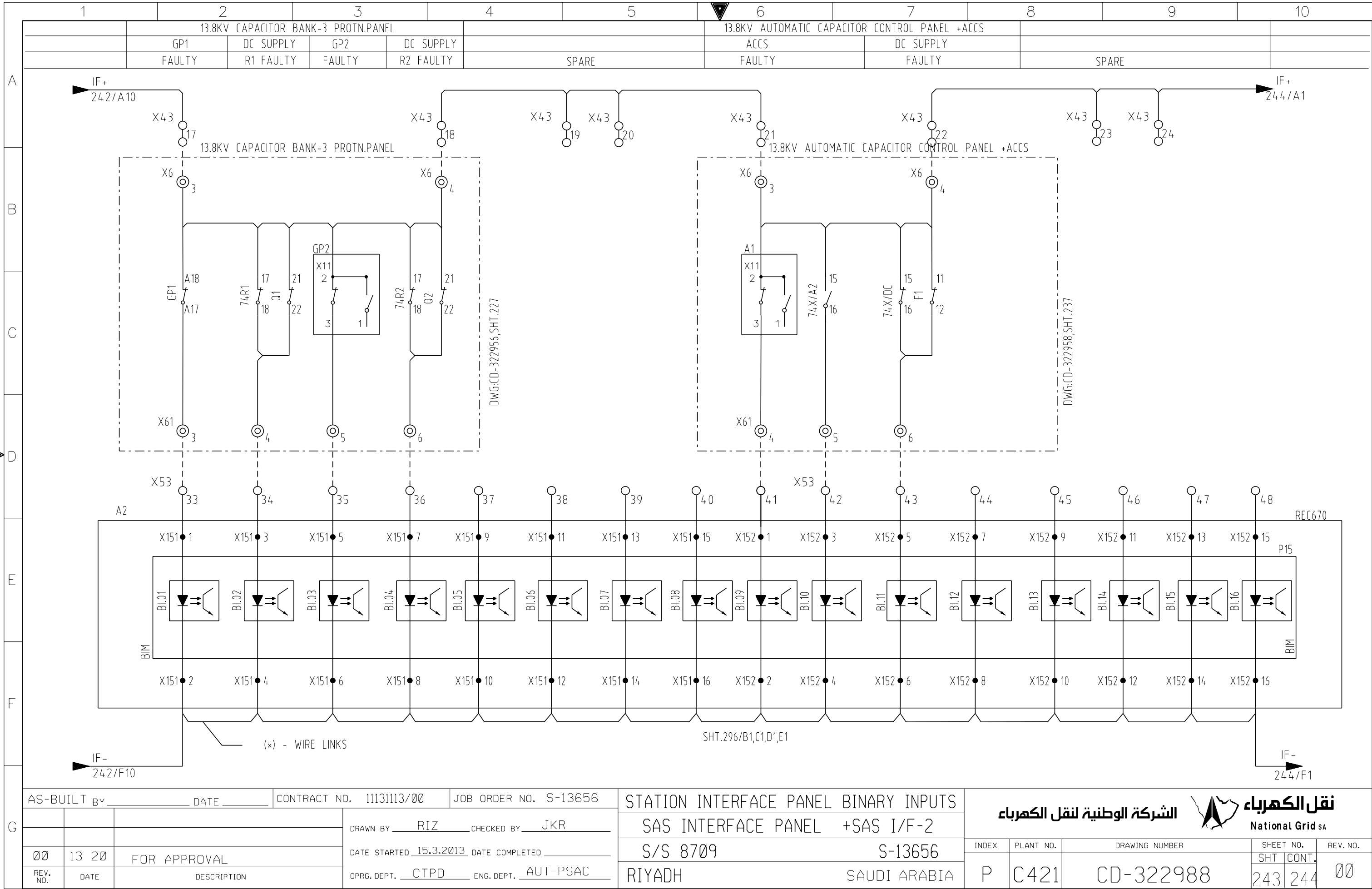
NGD200



AS-BUILT BY _____ DATE _____			CONTRACT NO. 11131113/00		JOB ORDER NO. S-13656	
			DRAWN BY <u>RIZ</u> CHECKED BY <u>JKR</u>			
00	13 20	FOR APPROVAL	DATE STARTED <u>15.3.2013</u> DATE COMPLETED _____			
REV. NO.	DATE	DESCRIPTION	OPRG. DEPT. <u>CTPD</u>		ENG. DEPT. <u>AUT-PSAC</u>	

STATION INTERFACE PANEL BINARY INPUTS	
SAS INTERFACE PANEL +SAS I/F-2	
S/S 8709	S-13656
RIYADH	SAUDI ARABIA

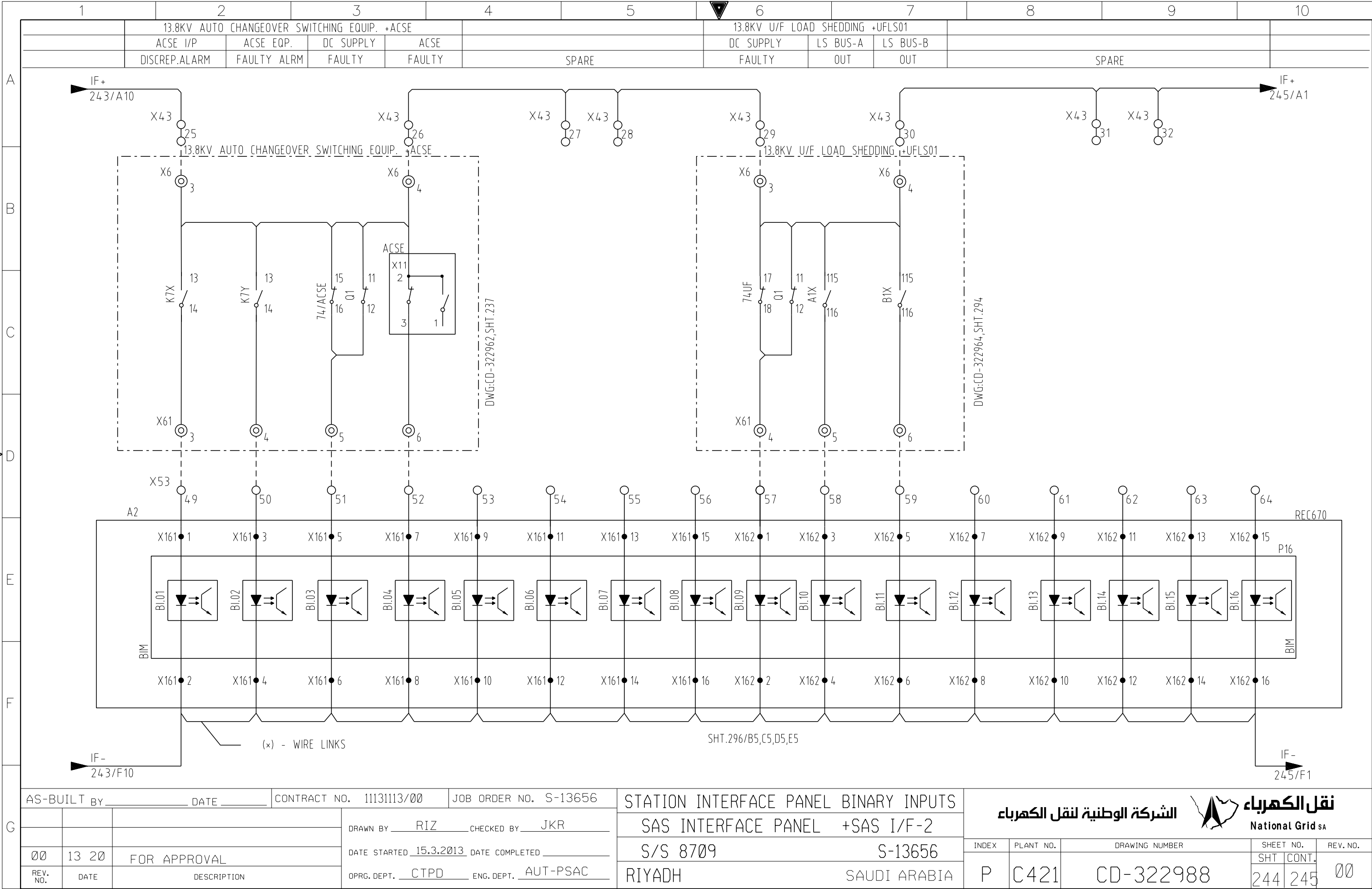
الشركة الوطنية لنقل الكهرباء National Grid sa				
INDEX	PLANT NO.	DRAWING NUMBER	SHEET NO.	REV. NO.
P	C421	CD-322988	SHT 242	CONT. 243
			00	

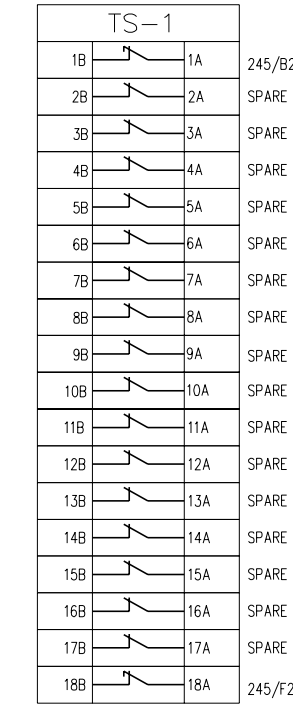


AS-BUILT BY _____ DATE _____			CONTRACT NO. 11131113/00		JOB ORDER NO. S-13656	
			DRAWN BY <u> RIZ </u> CHECKED BY <u> JKR </u>			
00	13 20	FOR APPROVAL	DATE STARTED <u> 15.3.2013 </u> DATE COMPLETED _____			
REV. NO.	DATE	DESCRIPTION	OPRG. DEPT. <u> CTPD </u>		ENG. DEPT. <u> AUT-PSAC </u>	

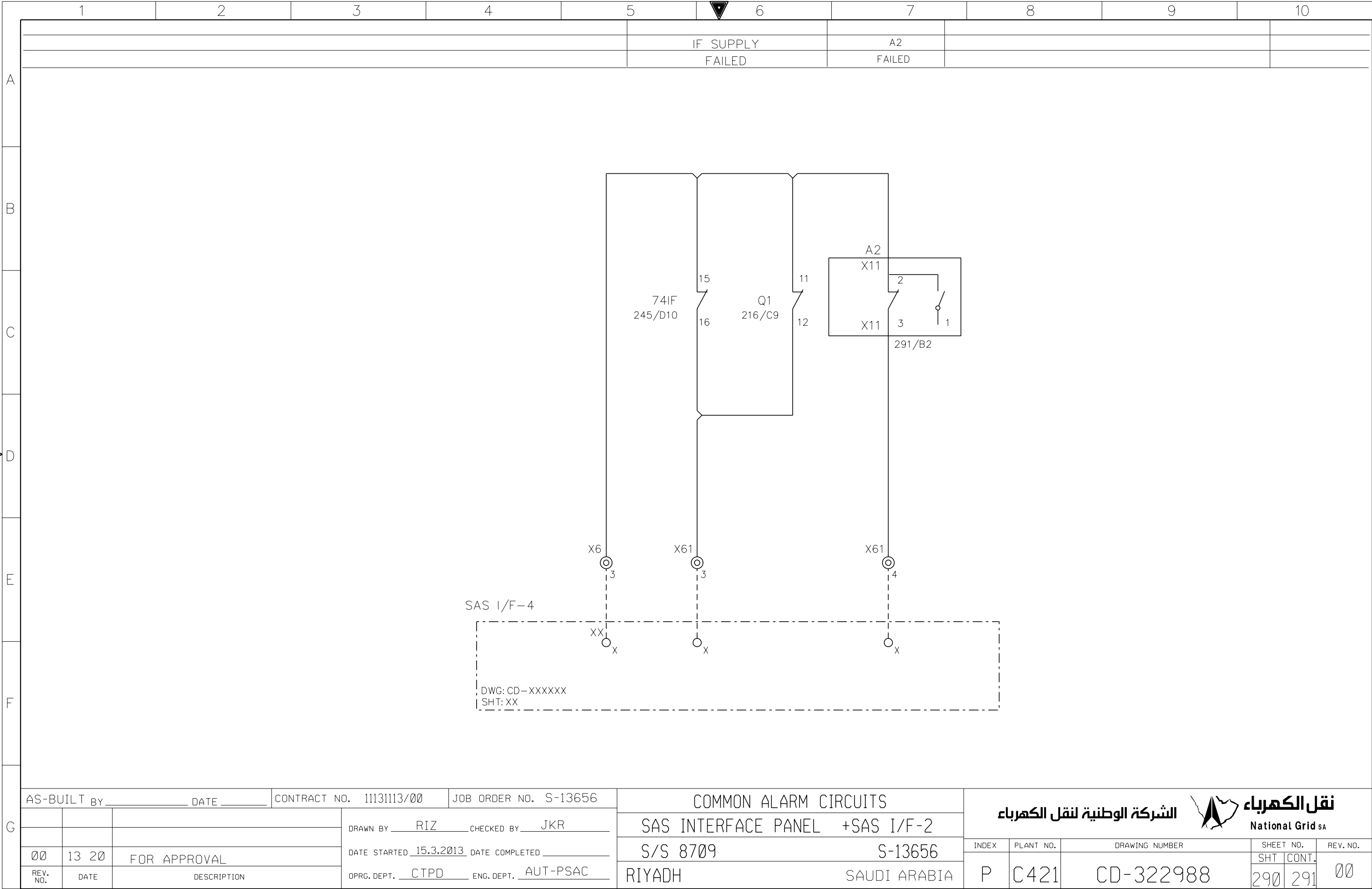
STATION INTERFACE PANEL BINARY INPUTS	
SAS INTERFACE PANEL +SAS I/F-2	
S/S 8709	S-13656
RIYADH	SAUDI ARABIA

الشركة الوطنية لنقل الكهرباء		نقل الكهرباء		National Grid sa	
INDEX	PLANT NO.	DRAWING NUMBER		SHEET NO.	
P	C421	CD-322988		SHT	CONT.
				243	244
				REV. NO.	
				00	

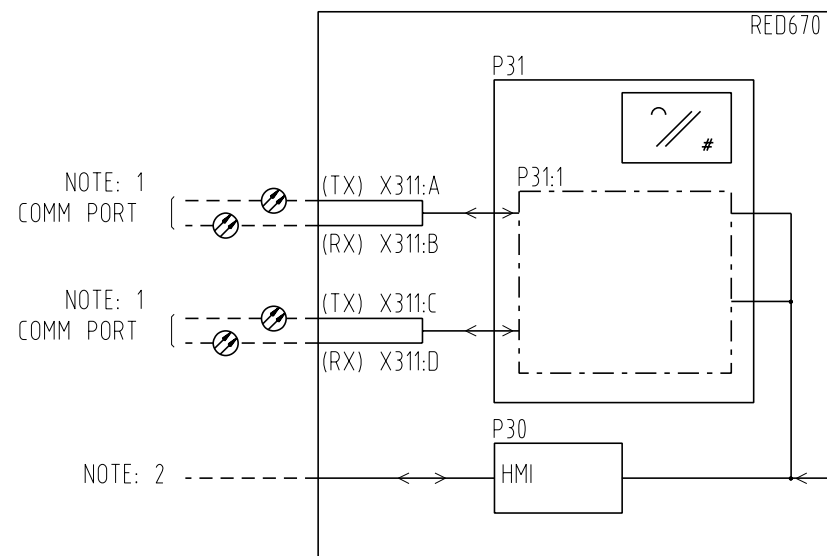




741F	
	245/E7 SPARE 290/D4 SPARE
SPARE	
	SPARE SPARE SPARE SPARE



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	1	2	3	4	5	6	7	8	9	10
A	A2									
BINARY INPUT CARD										
B	A2BIM P3REC670LOCATION=P3PLANT ADAPTED CONFIGURATION									
C	+ --- X31									
	- --- 1BI.01//									
	+ --- 2BI.02//									
	- --- 3BI.03//									
	+ --- 4BI.04//									
	- --- 5BI.05//									
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	- --- 13BI.21//									
+ --- 14BI.22//										
- --- 15BI.23//										
+ --- 16BI.24//										
- --- 16										
D	SHT.231/D1 TO D10									
E	A2BIM P4REC670LOCATION=P4PLANT ADAPTED CONFIGURATION									
F	+ --- X41									
	- --- 1BI.01//									
	+ --- 2BI.02//									
	- --- 3BI.03//									
	+ --- 4BI.04//									
	- --- 5BI.05//									
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	+ --- 14BI.14//									
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	+ --- 16BI.16//									
	- --- 16									
	+ --- X42									
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- --- 15BI.23//										
+ --- 16BI.24//										
- --- 16										
SHT.232/D1 TO D10										
G	A2BIM P5REC670LOCATION=P5PLANT ADAPTED CONFIGURATION									
	+ --- X51									
	- --- 1BI.01//									
	+ --- 2BI.02//									
	- --- 3BI.03//									
	+ --- 4BI.04//									
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	+ --- X52									
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- --- 16										
SHT.233/D1 TO D10										
AS-BUILT BY _____ DATE _____ CONTRACT NO. 11131113/00 JOB ORDER NO. S-13656										
BLOCK REFERENCE										
SAS INTERFACE PANEL +SAS I/F-2										
S/S 8709 S-13656										
RIYADH SAUDI ARABIA										
الشركة الوطنية لنقل الكهرباءNational Grid sa										
INDEX PLANT NO. DRAWING NUMBER SHEET NO. REV. NO.										
P C421 CD-322988 292 293 00										
NG/D2-D (2012/01)										
DMS VECTOR NGD200										

	1	2	3	4	5	6	7	8	9	10
A	A2									
BINARY INPUT CARD										
B	A2BIM P6REC670LOCATION=P6PLANT ADAPTED CONFIGURATION									
C	+ --- X61									
	- --- 1BI.01//									
	+ --- 2BI.02//									
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	+ --- X62									
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	- --- 13BI.21//									
+ --- 14BI.22//										
- --- 15BI.23//										
+ --- 16BI.24//										
- --- 16										
D	SHT.234/D1 TO D10									
E	A2BIM P7REC670LOCATION=P7PLANT ADAPTED CONFIGURATION									
F	+ --- X71									
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- --- 15BI.23//										
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- --- 16										
SHT.235/D1 TO D10										
G	A2BIM P8REC670LOCATION=P8PLANT ADAPTED CONFIGURATION									
	+ --- X81									
	- --- 1BI.01//									
	+ --- 2BI.02//									
	- --- 3BI.03//									
	+ --- 4BI.04//									
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- --- 15BI.23//										
+ --- 16BI.24//										
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SHT.236/D1 TO D10										
AS-BUILT BY _____ DATE _____ CONTRACT NO. 11131113/00 JOB ORDER NO. S-13656										
BLOCK REFERENCE										
SAS INTERFACE PANEL +SAS I/F-2										
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RIYADH SAUDI ARABIA										
الشركة الوطنية لنقل الكهرباءNational Grid sa										
INDEX PLANT NO. DRAWING NUMBER SHEET NO. REV. NO.										
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A	A2									
BINARY INPUT CARD										
B	A2BIM P15REC670LOCATION=P15PLANT ADAPTED CONFIGURATION									
C	+ --- X151									
	- --- 1BI.01//									
	+ --- 2BI.02//									
	- --- 3BI.03//									
	+ --- 4BI.04//									
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+ --- 16										
E	A2BIM P16REC670LOCATION=P16PLANT ADAPTED CONFIGURATION									
F	+ --- X161									
	- --- 1BI.01//									
	+ --- 2BI.02//									
	- --- 3BI.03//									
	+ --- 4BI.04//									
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00			S/S 8709S-13656							
REV. NO. DATE DESCRIPTION			RIYADH SAUDI ARABIA							
FOR APPROVAL			DRAWN BY RIZ CHECKED BY JKR							
			DATE STARTED 15.3.2013 DATE COMPLETED							
			OPRG. DEPT. CTPD ENG. DEPT. AUT-PSAC							
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REFERENCE	X51 CONTROL & PROTN.	231/D1	1	231/D2	2	231/D3	3	231/D3	4	231/D4	5	231/D4	6	231/D5	7	231/D5	8	231/D6	9	231/D6	10	231/D7	11	231/D8	12	231/D8	13	231/D9	14	231/D9	15	231/D10	16	232/D2	17	232/D2	18	232/D3	19	232/D3	20	232/D4	21	232/D4	22	232/D5	23	232/D5	24	232/D6	25	232/D6	26	232/D7	27	232/D8	28	232/D8	29	232/D9	30	232/D9	31	232/D10	32	233/D2	33	233/D2	34	233/D3	35	233/D3	36	233/D4	37	233/D4	38	233/D5	39	233/D5	40	233/D6	41	233/D6	42	233/D7	43	233/D8	44	233/D8	45	233/D9	46	233/D9	47	233/D10	48	234/D2	49	234/D2	50	<table><tr><th>INTERNAL REFERENCE</th><th>X51 CONTROL & 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REFERENCE	X51 CONTROL & PROTN.	234/D3	51	234/D3	52	234/D4	53	234/D4	54	234/D5	55	234/D5	56	234/D6	57	234/D6	58	234/D7	59	234/D8	60	234/D8	61	234/D9	62	234/D9	63	234/D10	64	235/D2	65	235/D2	66	235/D3	67	235/D3	68	235/D4	69	235/D4	70	235/D5	71	235/D5	72	235/D6	73	235/D6	74	235/D7	75	235/D8	76	235/D8	77	235/D9	78	235/D9	79	235/D10	80	SPARE	81	SPARE	82	SPARE	83	SPARE	84	SPARE	85	SPARE	86	SPARE	87	SPARE	88	SPARE	89	SPARE	90	<table><tr><th>INTERNAL REFERENCE</th><th>X41 DC 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